UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

4WD-RCRA

MAY 09 2003

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Carl Fajardo
Operations Manager
Appollo Industries Inc.
1850 South Cobb Industrial Boulevard
Smyrna, Georgia 30728

Subject: RCRA Compliance Evaluation Inspection
EPA ID Number: GAD 051 021 285

Dear Mr. Fajardo:

On April 29, 2003, the United States Environmental Protection Agency (EPA), along with the Georgia Environmental Protection Division (EPD), conducted a RCRA compliance evaluation inspection at your facility located in Smyrna, Georgia, in order to determine it's compliance status with RCRA.

Enclosed is the EPA RCRA Site Inspection Report which indicates that violations of RCRA were discovered. A copy of this report has also been forwarded to EPD. Pursuant to the EPA - EPD Memorandum of Agreement, EPD is the lead agency for any potential enforcement action which may result from the RCRA violations cited in the report.

If you have any questions, please contact Daryl Himes at (404) 562-8614.

Sincerely yours,

Jeffrey T. Pallas, Chief
South Enforcement and Compliance Section
RCRA Enforcement and Compliance Branch

Enclosure

cc: Ms. Jennifer Kaduck, EPD
Mr. John Williams, EPD

Docket Number 345864

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAY 09 2003

4WD-RCRA

Ms. Jennifer Kaduck, Chief
Hazardous Waste Management Branch
Environmental Protection Division
Georgia Department of Natural Resources
Floyd Towers East, Room 1154
205 Butler Street, S.E.
Atlanta, Georgia 30334

RE: RCRA Compliance Evaluation Inspection
Appollo Industries Inc.
EPA ID Number: GAD 051 021 285

Dear Ms. Kaduck:

On April 29, 2003, a Compliance Evaluation Inspection was conducted by the United States Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (GA EPD) at the Appollo Industries, Inc. facility located in Smyrna, Georgia to determine the facility's compliance status with RCRA.

Enclosed is the EPA RCRA Site Inspection Report which indicates that violations of RCRA were discovered. Pursuant to the EPA - GAEPD Memorandum of Agreement, GA EPD is the lead agency for enforcement of the violations discovered during this inspection.

Pursuant to the Enforcement Response Policy (ERP), Day 0 is the date of the inspection referenced above. Based upon the violations discovered during the referenced inspection, the facility is determined to be a Significant Non-Complier (SNC). Therefore, formal action is mandatory pursuant to the time frames outlined in the ERP.

If you have any questions, please contact Daryl Himes, at (404) 562-8614.

Sincerely yours,

Jeffrey T. Pallas, Chief
South Enforcement and Compliance Section
RCRA Enforcement and Compliance Branch.

Enclosure

cc: John Williams - EPD

RCRA Compliance Inspection Report

1) Inspectors and Authors of Report

Daryl Himes, Environmental Engineer
Bethany Russell, Environmental Scientist

2) Facility Information

Apollo Industries Inc. (Apollo)
1850 South Cobb Industrial Blvd
Smyrna, GA 30082
EPA ID No: GAD 051 021 285

3) Responsible Officials

Carl Fajardo, Operations Manager
Javeed Syed, Safety & Environmental Manager

4) Inspection Participants

Carl Fajardo- Apollo
Javeed Syed- Apollo
John Williams- GAEPD
Daryl Himes, US EPA
Bethany Russell, US EPA

5) Date and Time of Inspection

April 29, 2003, 8:50 a.m.

6) Applicable Regulations

40 Code of Federal Regulations (C.F.R.) Parts 260-270,
Resource Conservation and Recovery Act (RCRA) Sections 3005 and 3007,
(42 US Code - Annotated U.S.C.A. 6925 and 6927),
Chapter 391-3-11 of the Georgia Hazardous Waste Management Act, adopted and incorporated by reference Parts 260 - 266, 268, & 270.

7) Purpose of Inspection

The purpose of this inspection was to conduct an unannounced compliance evaluation inspection (CEI) and determine Apollo's compliance with the applicable requirements of RCRA and the corresponding Georgia Environmental Protection Division (GAEPD) regulations.

8) Facility Description

Apollo's Smyrna, Georgia facility is a large quantity generator of hazardous waste. Their primary business is the manufacture and packaging of aerosols and specialty chemicals which include, but are not limited to, insecticides, degreasers, and disinfectants. Currently, RCRA regulated wastes generated from the manufacture of these products include spent isopropyl alcohol and naptha (D001), chlorinated solvents (F002), acetone (F003) and toluene (F005).

9) Findings

The inspection began with an opening conference at 8:50 a.m. on April 29, 2003. Credentials were presented to Mr. Carl Fajardo, Operations Manager of Apollo, and the purpose of the inspection was stated. A closing conference was held following the inspection to discuss the findings. The areas inspected and findings are as follows:

Laboratory

At the time of inspection, there was one satellite 5-gallon container of spent solvent labeled F002, F005, F008, and D001. The container was open. **Apollo is in violation of RCRA § 3005 for failing to keep containers of hazardous waste closed except when it is necessary to add or remove waste in accordance with the requirements of Chapter 391-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporates by reference 40 CFR § 265.173(a), as referenced by 40 CFR § 262.34(c)(1)(i).** The violation was corrected during the inspection.

Warehouse/Process Building

The warehouse portion of the building primarily stored raw materials. At the time of inspection, inspectors observed a satellite accumulation area with three 55-gallon drums. Two of the drums were empty and the third contained spent rags and filters contaminated with xylene, trichloroethylene, and other listed wastes. The drum adhered to RCRA regulations. No violations were noted in this area. The process portion of the building is where aerosol cans are filled. The process begins with empty cans typically made of tinplated steel or aluminum. The product-specific chemicals in the form of liquid, emulsion, or suspension are then added to the can after mixing in the batch room. The aerosol valve is crimped onto the can and the propellant (isobutane/propane mix) is injected under pressure, through the valve (occurs in the gas house). The volume of each can is carefully measured and the off-spec cans are kicked out of the system. The pressurized can is then subjected to a waterbath of approximately 50 °C to check for any leaks. At the time of inspection, no hazardous waste was being stored in this area. No violations were noted.

Gas House

Propellants are added to the aerosol cans here under a pressure of approximately 500 psi through an automated system. At the time of inspection, no hazardous waste was being stored in this area. No violations were noted.

Outside the Gas House

Directly behind the gas house is a process line where aerosol cans are fed into the gas house. Inspectors observed one full 55-gallon drum of waste pesticide-filled cans. The drum was unlabeled and unsealed. **Apollo is in violation of RCRA § 3005 for failing to keep containers of hazardous waste closed except when it is necessary to add or remove waste as required by Chapter 391-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporate by reference 40 CFR § 265.173(a), as referenced by 40 CFR § 262.34(a)(1)(i). Apollo has failed to mark hazardous waste containers with the words "Hazardous Waste" and the accumulation start date in accordance with the requirements of Chapter 391-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporates by reference 40 CFR § 262.34(a)(2) and (3).**

Less Than 90-Day Storage Area

At the time of inspection, this area contained three 55-gallon drums of waste pesticide-filled aerosol cans. The drums were open and unlabeled (Photo 1). **Apollo is in violation of RCRA § 3005 for failing to keep containers of hazardous waste closed except when it is necessary to add or remove waste as required by Chapter 391-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporate by reference 40 CFR § 265.173(a), as referenced by 40 CFR § 262.34(a)(1)(i). Apollo has failed to mark hazardous waste containers with the**

words "Hazardous Waste" and the accumulation start date in accordance with the requirements of Chapter 391-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporates by reference 40 CFR § 262.34(a)(2) and (3).

Photo 1. Open, unlabeled drums in 90-day storage area.

Bustback Area

Off-spec filled aerosol cans are punctured and the contents emptied into a 55-gallon drum in this area. At the time of inspection, there was one satellite accumulated 55-gallon drum of "spent solvent waste". Both bungs were open on the drum (Photo 2). **Apollo is in violation of RCRA § 3005 for failing to keep containers of hazardous waste closed except when it is necessary to add or remove waste in accordance with the requirements of Chapter 391-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporates by reference 40 CFR § 265.173(a), as referenced by 40 CFR § 262.34(c)(1)(i).** The violation was corrected during the inspection.

Photo 2. Two bung holes opened on drum (foreground) in bustback satellite accumulation area.

Tank Farm

Hazardous waste generated at the facility is pumped into a 4,800-gallon wastewater tank before being shipped offsite for disposal by fuel blending. The facility had attached a piece of sheet metal to the top of the tank approximately two weeks prior to inspection (See Invoice for purchase of sheet metal attached to report). The metal had not been welded to the top of the tank and holes were evident between the sheet metal and tank (Photo 3). **Apollo is in violation of RCRA § 3005 for failing to comply with Tank Level 1 controls for Subpart CC in accordance with the requirements of Chapter 391-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporates by reference 40 CFR § 265.1085(c) as referenced by 40 CFR § 262.34(a)(1)(ii).** Apollo had not had the newly installed metal roof certified by a registered professional engineer. **Apollo is in violation of RCRA § 3005 for failing to obtain a certification by an independent, qualified, registered professional engineer in accordance with Chapter 39-3-11-.10 as incorporated by Chapter 39-3-11-.08 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporates by reference 40 CFR § 265.191(c) as referenced by 40 CFR § 262.34(a)(1)(ii).**

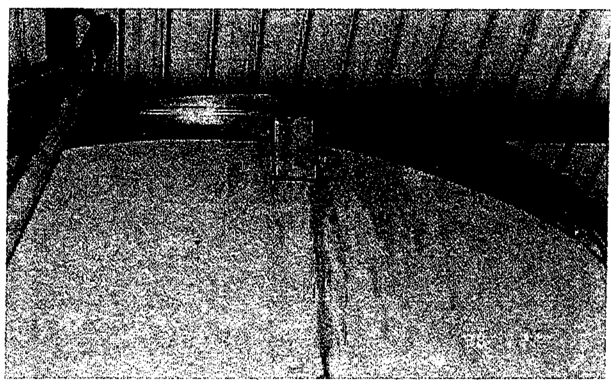

Photo 3. Roof of hazardous wastewater tank in tank farm area.

Compounding Room (Batch Room)

This area of the facility is used to mix chemicals for product-specific formulations. Chemicals are managed in 16 large tanks. Tanks are washed out regularly for chemical change-outs. Wastewater is pumped into the 4,800 gallon wastewater tank located in the tank farm. At the time of inspection, no hazardous waste was being stored in this area. No violations were noted.

Silkscreen Area

Apollo uses either silk-screening or paper-labeling to trademark aerosol cans. At the time of inspection, there were four 5-gallon buckets of "spent solvent hazardous waste" being accumulated as silkscreens were washed off with solvents such as tetrachloroethylene. This area also contained one 55-gallon drum used to collect waste from the 5-gallon buckets once full. All containers were closed and labeled according to RCRA regulations. Once the 55-gallon drum is filled to capacity, the contents are transferred to the wastewater tank. No violations were noted.

Record Review

Apollo's manifests for May 2002 through April 2003, inspection records, and contingency plan were reviewed and found to be in good order with the following exceptions. No personnel training records were available after 2001. **Apollo is in violation of RCRA § 3005 for failing to provide annual training to all personnel handling hazardous waste at the facility and for failing to have job titles, descriptions, and the name of each person filling each position related to hazardous waste management in accordance with the requirements of Chapter 391-3-11-.10 of the Georgia Department of Natural Resources Environmental Protection Rules which incorporates by reference 40 CFR § 265.16(c) and (d)(1, 2, & 3).**
Three manifests, document numbers 00718, 09182, and 12162, were missing the original copies signed by the Treatment, Storage, and Disposal (TSD) facility. The manifests were located after the inspection and submitted to GA EPD.

10) Signed:

Daryl Himes
Environmental Engineer

5/8/03
Date

Bethany Russell
Environmental Scientist

5/2/2003
Date

11) Concurrence:

Jeffrey T. Pallas, Chief
South Enforcement and Compliance Section
RCRA Enforcement and Compliance Branch

5/9/03
Date

Dixie Duct & Fabrication Inc
122 Oak Street
Roswell, GA 30075

Voice: 770-642-4500
Fax: 770-642-7472

Invoice

Invoice Number: 27096

Invoice Date: Apr 16, 2003

Page: 1

Sold To:

Apollo Industries Inc
1850 South Cobb Industrial Blv
Smyrna, GA 30082

Special Instructions/Notes:

Customer ID	Customer PO	Payment Terms
AP01	40317/18 ga caps	1% 10, Net 30 Days

Sales Rep ID	Shipping Method	Ship Date	Due Date
80	Best Way	4/16/03	5/16/03

Quantity	Item	Description	Unit Price	Extension
		MANUFACTURED SHEET METAL/ 18 gauge galv 96" round x 4 caps		810.00

Exemption 4 Confidential Business Information (CBI)

Exemption 4 Confidential Business Information (CBI)

2B

RECEIVED
APR 9 2003

Customer Resale #: 033-79-20994-6

Check No:

Subtotal	810.00
Sales Tax	
Freight	
Total Invoice Amount	810.00
Payment Received	0.00
TOTAL	810.00

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Georgia Department of Natural Resources

2 Martin Luther King, Jr. Drive, SE, Suite 1066 East, Atlanta, Georgia 30334-9000
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
Office: 404/657-8831 FAX: 404/463-6676

June 30, 2003

Mr. Jeffrey T. Pallas, Chief
South Enforcement & Compliance Section
Enforcement & Compliance Branch
U.S. EPA, Region IV
61 Forsyth Street, 10th Floor
Atlanta, Georgia 30303

SUBJECT: PBT/ Large Quantity Generator Inspection
Apollo Industries, Inc.
EPA Identification Number: GAD051021285

Dear Mr. Pallas:

On April 29, 2003, a joint EPA and Georgia EPD Compliance Evaluation Inspection was performed at the subject facility. Pursuant to the Memorandum of Agreement, enclosed is a copy of the Inspection Checklists used during this inspection. The State of Georgia has prepared a proposed Consent Order for the violations. We will forward a copy of that Order to you, once the Order has been executed by the Director.

Ms. Renée Hudson Goodley, Program Manager of the Generator Compliance Program, may be contacted for additional information regarding this facility at 404-657-8828.

Sincerely,

Jennifer R Kaduck

Jennifer R. Kaduck
Chief
Hazardous Waste Management Branch

JRK/JAW/jw
Enclosures
c: Renée Hudson Goodley
Freddie L. Dunn, Jr.
File: EPA Correspondence-FY 2003
Apollo Industries, Inc., Smyrna

s:\rdrive\John\ Apollo Industries EPA Ltr.doc

R4178492

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, S. E., Suite 1066 East, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
Office: 404/657-8831 Fax: 404/463-6676

GENERATOR INSPECTION REPORT

SECTION I: FACILITY INFORMATION			
Facility Name: Apollo Industries, Inc.			
EPA Identification Number: GAD051021285		NAICS: 325998	
Location Address: 1850 South Cobb Industrial Blvd.			
City: Smyrna	County: Cobb		Zip Code: 30082
Mailing Address: Same as above			
City:	State:		Zip Code:
LQG: X	SQG:	Trans:	TSD:	Other (specify)
Additional Checklists Required:			
Tank: X	Transporter	Used Oil Mgt.	Subpart CC: X
Estimated Quantity of Hazardous Waste Generated: Avg.37,706 lbs/mo			
Basis for Estimate: Manifest for 2002 and 2003			
Officials Contacted: cfajardo@apolloind.com jsyed@apolloind.com			
Name: Mr. Carl Fajardo	Title: Mgr. Mfg. Ops.	Telephone # (770) 433-0210	
Name: Mr. Javeed Syed	Title: Environmental & Safety Manager.	Telephone # (770) 433-0210 Ext. 1228	

SECTION II: SUMMARY OF FINDINGS:

The following violations of Georgia's Rules of Hazardous Waste Management were observed: Satellite containers were not labeled with the contents; all drums in the storage area were not marked "hazardous waste" or dated; the bust back aerosol satellite drum both bung holes and the lab 5-gallon container were not closed; annual hazardous waste training was not provided in 2002 to the silk screen printing, bust back, and batch room hazardous waste employees; these same employees did not have job titles, descriptions with the type of initial and continuing training and the name of each person filling each position; the hazardous wastewater storage tank did not have a certification by an independent Professional Engineer; and the hazardous wastewater tank did not meet the Subpart CC Tank Level 1 controls.

Samples:	Yes:	No: X	Photographs:	Yes:	No: X
Inspected by: John A. Williams *[signature]*			Inspection Date: April 29, 2003		
Reviewed by: *Freddie L. Dunn, Jr.*			Review Date: *06/04/2003*		
Submittal Date: May 8, 2003					
Attachments: Location map.					
Accompanied by: Mr. Daryl Himes, Environmental Engineer and Ms. Bethany Russell, Environmental Scientist, EPA Region IV					
File Name: Apollo Industries, Smyrna PBT Annual Notebook					

s:\rdrive\John\ Apollo 03 inspection report.doc

SECTION III: PRE-INSPECTION REVIEW

A. GENERAL INFORMATION

1. Regulated Waste Activity Notification Form on File:	Yes	X	No	
2. Most Recent Date of Notification Form: December 6, 2001				

Facility notified as a:

GENERATOR

X	LQG (1,000 KG/MO)		TRANSPORTER
	SQG (> 100 KG/MO or <1,000KG/MO		TSD
	CESQG (100 KG/MO)		

MOST RECENT EPA HAZARDOUS WASTE CODES DOCUMENTED BY FILES:

1				2				3				4			
D	0	0	1	D	0	0	2	D	0	3	5	D	0	3	9
5				6				7				8			
D	0	4	0	F	0	0	1	F	0	0	3	F	0	0	5
9				10				11				12			

SOURCE OF ABOVE INFORMATION/DATE: Notification							
BIENNIAL REPORT (S) ON FILE:	X	YES		NO		N/A	REQUIRED YEAR (S):2001
EXCEPTION REPORT (S) ON FILE:		YES	X	NO	X	N/A	DATE (S):
HAZARDOUS WASTE REDUCTION PLAN (S) ON FILE: 2002	X	YES		NO		N/A	
LAST INSPECTION DATE: May 8, 2003							
a) VIOLATIONS NOTED: No start date on drum; label drum in satellite and storage; EH&S Mgr. Needs a job description; secondary berm on bust back needed; submit copy of contingency plan to hospital; drum not closed at rotary line; no weekly inspection of containers; need PE tank assessment; leak detection on tank; daily inspection logs on tank; Subpart CC exceeds 500 ppmw; and LDR missing.							
b) DATE OF LAST ENFORCEMENT ACTION: Notice of Violation July 12, 2002							

Note: If this inspection includes sampling, a Site Safety Plan must be approved prior to the Inspection and attached to this report.

(N/A – Not applicable)

SECTION IV: FIELD OBSERVATION DATA

A. WASTE GENERATION

WASTE GENERATION		SATELLITE ACCUMULATION			
PROCESS GENERATING HAZARDOUS WASTE	HOW THE FACILITY CLASSIFIED THE WASTE (waste code)	IS THERE SATELLITE ACCUMULATION? §262.34(c)(1) (Est. Volume in Gallons)	LABELING OF CONTAINER(S) §262.34(c)(1)(ii)	CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172	CONTAINER(S) CLOSED §265.173
Laboratory solvent waste	D001	2.5 gallons	Yes`	Good/Metal	No, this violation was corrected during the inspection.
Flammable Rags	D001	35 gallons	Yes	Good/Metal	Yes
Bust Back Area	D001, D035, F001, & F003	20 gallons	Yes	Good/Metal	No, this violation was corrected during the inspection.
Parts washer	D001	In Process	In Process	In Process	In Process
Silk Screen TCE four on gallon containers of solvent	D001, F001, F003, & F005	In Process	In Process	In Process	In Process
Silk Screen TCE	D001, F001, F003, & F005	40 gallons	Yes	Good/Metal	Yes

Fluorescent Lamps, Mercury Vapor Lamps, Compact Fluorescent Lamps? Purchases Alto low-mercury green-end cap lamps.
COMMENTS: *(Attach description and schematic of facility's hazardous waste processes at end of checklist)*

See description of hazardous waste processes attached.

SECTION IV: CONTINUED

B. HAZARDOUS WASTE STORAGE AREA

WASTESTREAM (waste codes)	NUMBER OF CONTAINER(S) (Specify Volume if not 55-Gallon)	CONTAINER(S) MARKED HAZARDOUS WASTE §262.34(a)(3)	CONTAINER(S) MARKED WITH ACCUMULATION DATE §262.34(a)(2)	CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172	CONTAINER(S) CLOSED §265.173	ADEQUATE AISLE SPACE §265.35
Waste water wash down D001, F002, F003, & F005	500 gallons in a 4,800 gallon tank	Yes	Yes (Kept in log book)	Good/Metal	No* openings in newly installed roof.	Yes
Bust Back area	3	No*	No*	PVC **	No*	Yes
Outside of gas house	1	No*	No*	PVC **	No*	Yes

IGNITABLE OR REACTIVE WASTE STORED >50 FEET FROM PROPERTY LINE? (§265.176)	X	YES		NO		N/A
ARE INCOMPATIBLE WASTE SEPARATED BY DIKE, BERM, WALL OR OTHER DEVICE? (§265.177)		YES	X	NO	X	N/A

COMMENTS:

* Denotes Violations.

** PVC is not an approved container for storing flammable liquids under the Cobb County Fire Services code.

	YES	NO	N/A	VIOLATION
C. TANK STORAGE/TREATMENT				
1. Does the facility use tanks to store or treat hazardous waste? If yes, see Tank Systems Checklist for Generator	X			
D. EMERGENCY EQUIPMENT				
1. Is facility operated and maintained to minimize possibility of fire, explosion, or release of hazardous waste to the environment? (§265.31)	X			
2. Does the facility have the following equipment to deal with hazards posed by waste handled: (§265.32)				
a. Alarm system? (internal communication)	X			
b. Telephone or 2-way radio? (external communication)	X			
c. Fire extinguisher?	X			
d. Water? (If applicable)	X			
e. Are facility communication system, spill control equipment, fire protection equipment and decontamination equipment tested and maintained to ensure proper operation? (§265.33)	X			
f. Do personnel have immediate access to communication device or alarm system? (§265.34)	X			

List type of device or if verbal communication used:

Telephone

SECTION V: GENERAL RECORDS

	YES	NO	N/A	VIOLATION
1. Has facility notified of correct hazardous waste activity? (§262.12)	X			
2. Does the facility conduct the weekly inspections of containers storing hazardous waste (§262.34) (§265.174)	X			
3. Are waste profiles, waste analysis, or supporting documentation of waste determination per §262.11 in the facility's records? (§262.11) (§262.40)(c)	X			
4. Have biennial reports been submitted? (§262.41)	X			
5. Are copies of the biennial reports in the facility's records? (§262.40)	X			
6. Have arrangements with the local authorities been made to familiarize them with the facility, types of waste handled, and hazards posed? (§265.37)	X			
7. Does generator package waste in accordance with 49 CFR Parts 173, 178, and 179 (DOT requirements)? (§262.30)	X			
a. Does generator follow DOT labeling requirements in accordance with 49 CFR 172? (§262.31)	X			
b. Does generator mark each package in accordance with 49 CFR 172? (§262.32(a))	X			
c. Is each container of 110 gallons or less marked with the following label? (§262.32(b))	X			

Hazardous Waste-Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator Name and Address ______________________________
Manifest Document Number ______________________________

	YES	NO	N/A	VIOLATION
d. Does generator have placards to offer to transporter? (§262.33)	X			
8. Have fees been paid?	X			
a. Have the fee records (LQG) and fee report (LQG,SQG) been signed by a responsible corporate official? (391-3-19-.03(5))	X			

SECTION V: CONTINUED

	YES	NO	N/A	VIOLATION
b. Have the fee records (LQG) and the fee report (LQG,SQG), along with supporting documentation, been maintained on-site for a period of at least three years from the end of the calendar year for which they were completed (enacted July 1992)? (391-3-19-.03(5))	X			
c. Does the fee record (LQG) contain the following: (391-3-19-.03(5))				
1. Manifest number for each shipment?	X			
2. Date of each shipment?	X			
3. Name and EPA I.D. Number of the final receiving facility for each shipment?	X			
4. By EPA hazardous waste number and method of management at the final receiving facility, the tons of hazardous waste for each shipment and the total tons of hazardous waste for the calendar year?	X			
d. Have any discrepancies been noted between the fee records, fee reports, and the manifests for the subject period?		X	X	

COMMENTS:

Section V.8.d. – No discrepancies were found. The facility paid $1,879.33 in hazardous waste fees in 2002.

SECTION VI: CONTINGENCY PLAN

A. LARGE QUANTITY GENERATOR

	YES	NO	N/A	VIOLATION
1. Does the facility have a written Contingency Plan (§265.51) or a written Spill Prevention, Control, and Counter measures Plan (SPCC)? (§265.52(b))	X			
2. Does the Contingency Plan/SPCC Plan include:				
a. Facility personnel action responses? (§265.52(a)	X			
b. Description of agreement with the local authorities? (§265.52(c))	X			
c. List of names, addresses, and phone numbers of emergency coordinators. Designates primary emergency coordinator, and list other coordinators in order of assumption of responsibility? (§265.52(d)	X			
d. List of emergency equipment at the facility, including location, physical description and capabilities? (§265.52(e))	X			
e. An evacuation plan for facility personnel? (§265.52(f))	X			
3. Have copies of the Contingency Plan/SPCC Plan been submitted to police, fire department, hospital, local emergency response teams? (§265.53)	X			
4. Is the Contingency Plan/SPCC Plan amended when necessary? (§265.54)	X			
5. Is at least one emergency coordinator on facility premises or on call? (§265.55)	X			
6. Does the emergency coordinator respond immediately to emergencies, keep a record of these responses, and the report made to Federal, State, and local authorities, if required? (§265.56)	X			

SECTION VI: CONTINUED

	YES	NO	N/A	VIOLATION
B. SMALL QUANTITY GENERATOR				
1. Is the following information posted next to the telephone: (§262.34(d)(5))		X	X	
a. Name and telephone number of emergency coordinator?		X	X	
b. Location of fire extinguishers, spill control material and, if present, fire alarm?		X	X	
c. Telephone of the fire department if no direct alarm exists?		X	X	
2. Is at least one emergency coordinator on facility premises or on call? (§262.34(d)(5)(i))		X	X	
3. Does emergency coordinator respond immediately to emergencies as expressed by §262.34(d)5(iv)?		X	X	

COMMENTS:

SECTION VII: PERSONNEL TRAINING

	YES	NO	N/A	VIOLATION
A. LARGE QUANTITY GENERATOR				
1. Does facility have a personnel training program for hazardous waste management, consisting of classroom instruction or on the job training? (§265.16(a)(1)) (Note in Comment Session)	X			
a. Is training directed by a person trained in hazardous waste management procedures? (§265.16(a)(2 and 3))	X			
b. Do personnel complete training within 6 months of employment or job assignments? (§265.16(b))	X			
c. Do personnel take part in annual review of hazardous waste training? (§265.16(c))		X		X
d. Are the following documents maintained per §265.16(d):				
1. Job title and name of employee? (§265.16(d)(1))		X		X
2. Job description? (§265.16(d)(2))		X		X
3. Amount and type of initial and continuing training to be given to each person filling a position? (§265.16(d)(3))		X		X
2. Are records that document training as job experience given to and completed by personnel? (§265.16(d)(4))	X			
3. Are records kept until closure of facility or 3 years past employment of individual personnel? (§265.16(e))	X			
B. SMALL QUANTITY GENERATOR				
1. Are employees thoroughly familiar with proper waste handling and emergency procedures as relevant to there responsibilities during normal facility operations and emergencies? (§262.34(d))		X	X	

COMMENTS:

Section VII, Question 1.c and d 1, 2, and 3. – Annual hazardous waste training was not providec 2002 to the silk screen label printing, bust back, and batch room hazardous waste employe These same employees did not have job titles, descriptions with the type of initial a continuing training and the name of each person filling each position.

SECTION VIII: MANIFEST/LAND DISPOSAL RESTRICTION

	YES	NO	N/A	VIOLATION
1. Are manifests kept in the facility's records for three years? (§262.40)	X			
2. Did generator retain one copy of manifest signed by the generator and transporter for three years or until the facility received a signed copy from the designated permitted facility, which received the waste? (§262.23(a)(3))	X			
3. Are manifests completed to include: (Part 262, Subpart B)				
a. Manifest Document Number?	X			
b. Generator's name, mailing address, telephone number?	X			
c. Generator's EPA ID Number?	X			
d. Transporter's name and EPA ID Number?	X			
e. TSD's facility name, address, and EPA ID Number?	X			
f. Waste information required by DOT: proper shipping name, quantity of waste, and type of container?	X			
4. Did generator sign and date all manifests? (Part 262, Appendix)	X			
5. Did generator obtain original carbon copy with handwritten signature and date of acceptance from initial transporter and the receiving TSD? (§262.23)	X			
6. Did the generator file any exception reports? (§262.42)		X	X	
7. Are exception reports kept for three years? (§262.40)		X	X	
8. Has the generator determined that the facility is managing (§268.7):				
a. A land disposal restricted waste?	X			
b. A land disposal restricted waste that can be land disposed without any further treatment?		X	X	
c. A waste that is subject to an exemption from the land disposal restriction prohibition (i.e.- A				

SECTION VIII: CONTINUED

	YES	NO	N/A	VIOLATION
9. Does the land disposal restriction notification/ certification include: (§268.7)	X			
a. EPA Hazardous Waste Numbers? (i.e. characteristics, listed waste) (§268.9)*	X			
b. Manifest number?	X			
c. Certification that the waste meets the treatment standards found in Part 268, Subpart D?	X			
d. Certification that the waste can be land disposed without any further treatment?		X	X	
e. Certification that the waste is exempt from land disposal restriction requirements and includes date, which this exemption applies?		X	X	

***If a hazardous waste determination consists of both Listed and Characteristic EPA waste codes, the applicable LDR waste cod can exclude the Characteristic waste code if the specific hazardous constituent responsible for that Characteristic is alread addressed by the treatment standard for the Listed waste code (i.e., an ignitable, spent acetone solvent characterized as F00: D001 would have a LDR waste code of F003). Otherwise, all EPA waste codes subject to LDR must be cited.**

	YES	NO	N/A	VIOLATION
10. Has facility notified designated TSD facility per requirements? (§268.7(a)(1)).	X			
11. Does facility maintain copies of LDR determinations, notifications, waste analysis, etc. relating to requirements in records for three years? (§268.7(a)(5)(6)(7))	X			
12. Are any lab pack waste(s) shipped off-site? (§268.7(a)(8)(9))		X	X	
13. Does generator treat waste(s) in tanks or containers to comply with land disposal restriction requirements? (§268.7(a)(4))		X	X	
a. Does Waste Analysis Plan include detailed chemical and physical analysis and all information to treat the waste(s)? (§268.7(a)(4)(i))		X	X	

SECTION VIII: CONTINUED

	YES	NO	N/A	VIOLATION
b. Has a copy of Waste Analysis Plan been submitted to Regional Administrator and Environmental Protection Division? (§268.7(a)(4)(ii))		X	X	
i. Has submittal been verified? (§268.7(a)(4)(ii)		X	X	
ii. Has facility notified designated TSD per Requirement? (§268.7(a)(3)) and (§268.7(a)(4))		X	X	
c. Does the generator treat wastes which exhibit a characteristic to render the waste non-hazardous and ships this waste to a subtitle D facility? (§268.9(d))		X	X	
i. Are notices made to EPA and EPD?		X	X	
ii. Are copies of the notices kept in the facility's records?		X	X	
iii. Do the notices comply with the requirements in §268.9?		X	X	
14. Is this facility a small quantity generator whose waste is reclaimed under a contractual agreement (§262.20(e))?		X	X	
a. Are the type(s) of waste and frequency of removal specified in the contract agreement?		X	X	
b. Is the vehicle used to transport waste to recycling facility and to deliver regenerated material back to the generator owned and operated by the reclaimer of the waste?		X	X	
c. Did generator maintain a copy of the reclamation agreement in the facility records for at least three years after termination or expiration of there agreement?		X	X	
d. Did generator maintain a copy of the initial land disposal restriction notification in the facility's records for at least three years after the termination or the expiration of the contract? (§268.7)(a)(10)		X	X	

COMMENTS:

SECTION IX: USED OIL MANAGEMENT

	YES	NO	N/A	VIOLATION
A. USED OIL ACTIVITIES				
1. Does this facility burn used oil fuel for energy recovery or market used oil fuel directly to such a burner? If yes, see Used Oil Management Checklist, (Section IX)		X	X	
2. Does the facility generate used oil?		X	X	
B. USED OIL STORAGE (279.22, 279.45, 279.54, 279.64)				
1. Does the facility store used oil?		X	X	
2. Is the used oil stored in tanks, containers, or units subject to regulation under 40 CFR Parts 264 or 265?		X	X	
3. Are the containers and aboveground tanks in good condition with no leaks?		X	X	
4. Are containers, aboveground tanks, and fill pipes for underground storage tanks labeled or marked clearly with the words "Used Oil?"		X	X	
5. Have any releases of used oil to the environment occurred? (describe in comment section)		X	X	
a. Did the facility stop the release?		X	X	
b. Did the facility contain the released used oil?		X	X	
c. Did the facility clean up and manage properly the released used oil and other materials?		X	X	
d. Did the facility repair or replace any leaking storage containers or tanks to prevent future releases prior to returning them to service?		X	X	
C. HAZARDOUS WASTE MIXING (279.21)				
1. Does the generator mix hazardous waste with the used oil?		X	X	
a. Does the mixture exhibit any characteristics of hazardous waste? (If yes, regulated as hazardous waste under Part 262.)		X	X	

	YES	NO	N/A	VIOLATION
b. Does the used oil contain greater than 1,000 ppm total halogens? (If yes, presumed to be hazardous.)	____	__X__	__X__	____

D. ON-SITE BURNING IN SPACE HEATERS (279.23)

	YES	NO	N/A	VIOLATION
1. Does the generator burn used oil in used oil-fired space heaters?	____	__X__	__X__	____
a. Does the generator burn only used oil generated at the facility or received from household do-it-yourself used oil generators?	____	__X__	__X__	____
b. Is the heater designed to have a maximum capacity of not more than 0.5 million Btu per hour?	____	__X__	__X__	____

E. OFF-SITE SHIPMENTS (279.24)

	YES	NO	N/A	VIOLATION
1. Does the generator transport the facility's used oil or used oil from do-it-yourselfers to a used oil collection center?	____	__X__	__X__	____
a. Is the used oil transported in a vehicle owned by the facility or an employee?	____	__X__	__X__	____
b. Does the generator transport more than 55 gallons at any time?	____	__X__	__X__	____
c. Is the collection center registered, licensed, permitted, or recognized by a state/county/ municipal government to manage used oil?	____	__X__	__X__	____
2. Does the generator transport the facility's used oil to an aggregation point?	____	__X__	__X__	____
a. Is the used oil transported in a vehicle owned/ operated by the facility or an employee?	____	__X__	__X__	____
b. Does the generator transport more than 55 gallons at any time?	____	__X__	__X__	____
c. Is the aggregation point owned and/or operated by the same generator?	____	__X__	__X__	____

SECTION IX: CONTINUED

	YES	NO	NA	VIOLATION
3. Does the generator have a contractual agreement pursuant to which reclaimed oil is returned by the processor/re-refiner to the generator for use as a lubricant, cutting oil, or coolant?		X	X	
a. Does the contract indicate the type of used oil and the frequency of shipments?		X	X	
b. Does the contract indicate that the vehicle used to transport the used oil to the processing/re-refining facility and to deliver recycled used oil back to the generator is owned and operated by the used oil processor/re-refiner?		X	X	
c. Does the contract indicate that reclaimed oil will be returned to the generator?		X	X	
4. Does the generator ensure that the used oil is transported only by transporters who have obtained EPA identification numbers?		X	X	

F. USED OIL FILTER EXCLUSION (261.4(b)(13))

	YES	NO	NA	VIOLATION
1. Does the generator manage used oil filters?		X	X	
a. Are the filters non-terne plated?		X	X	
b. Are the filters gravity hot-drained?		X	X	

COMMENTS:

Section VIII, question 11. Need LDR for Allworth manifest. This violation was corrected during the follow-up inspection on May 17, 2002, with a one-time copy of the LDR being maintained on file.

Apollo Industries, Inc., PBT/Large Quantity Generator
Smyrna, Cobb County
EPA I.D. Number GAD051021285

SECTION IV: FIELD OBSERVATION DATA (Page 3 Continued)

COMMENTS: Description of processes that generate hazardous waste

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The facility manufactures aerosol products including bug spray, cleansers, etc. The facility generates the following wastes. Process waste waters including spent water bath effluent generated when the water bath is changed, and when washout water from the compounding area is generated from rinsing lines, tanks, and pumps. Process waste waters are accumulated in an aboveground storage tank for off-site shipment. Isopropyl alcohol washout is generated in the compounding area from rinsing operations. The spent alcohol solution is accumulated in an aboveground storage tank for off-site shipment.

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Hazardous waste solids consist of waste sorbent pads, gloves, filters, filter bags, and boxes. Spent carbon from water bath filter array is typically added to the hazardous solids waste stream. This solids waste stream is collected in drums for off-site disposal. Batch room waste is generated from cross contamination of products at product line changeover. C-Mac from St George, SC disposes of the flammable solids in a hazardous waste landfill.

Batch room waste water is accumulated in an aboveground hazardous wastewater storage tank for off-site disposal. Chlorinated solvent results from the cleaning of ink-stained silk screens, and the removal of inks from cans, using chlorinated solvents such as perchloroethylene, and trichloroethylene. This chlorinated waste is accumulated in a drum and then pumped into the 4,800 gallon hazardous wastewater storage tank.

Discontinued, obsolete, and returned products are approximately 25% of the total waste generated. This obsolete waste material is accumulated in an aboveground hazardous wastewater storage tank for off-site disposal. The facility was observed to be storing hazardous waste in containers for four waste streams including flammable rags, lab waste and floor sweepings, silk screen spent trichloroethylene, and bust back off-specification products. The bust back satellite area is where all the off-specification aerosol cans in 55-gallon drums are stored to puncture the aerosol can and drain out the product into a 55-gallon spent solvent drum;

A solvent parts washer generates spent solvent, which is also pumped into the 4,800-gallon hazardous wastewater storage tank. The hazardous wastewater is sent for fuels blending to Lonestar Alternate Fuels in Green Castle, Indiana.

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Street. S.E., Suite 1066 East, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harlod F. Reheis, Director
Office: 404/657-8831 FAX: 404/463-6676

TANK SYSTEMS CHECKLIST FOR GENERATORS

SECTION I
FACILITY INFORMATION

Facility Name: Apollo Industries, Inc.				
EPA Identification Number: GAD051021285		NAICS Code: 325998		
Location Address: 1850 S. Cobb Industrial Blvd.				
City: Smyrna	County: Cobb		Zip Code: 30082	
Mailing Address: Same				
City:	County:		Zip Code:	
LQG: X	SQG:	TRANS:	TSD:	Other (specify):
Additional Checklists Required	Generator:		Transporter:	Used Oil:
Estimated Quantity of Hazardous Waste Generated: Avg. 37,706 lbs monthly				
Basis for Estimate 2001 manifest				
Officials Contacted:				
Name: Mr. Carl Fajardo	Title: Mgr. Mfg. Operations		Telephone#: (770) 433-0210	
Name: Mr. Javeed Syed	Title: E/S Manager		Telephone#: (770) 433-0210	

SECTION II
SUMMARY OF FINDINGS

The following violations of 40 CFR 265 Subpart J – Tank Systems were observed: The 4,800-gallon hazardous wastewater storage tank system needs to have a Professional Engineer's assessment and certification.

Samples: Yes		Number of Samples:	No	X
Photographs: Yes		Number of Photographs:	No	X
Inspected by: John A. Williams		Inspection Date: April 29, 2003	Submittal Date: May 8, 2003	
Reviewed by: Freddie L. Dunn, Jr.		Review Date: 06/04/2003		
Attachments: None				
File Name: Apollo Industries, Inc.				

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SECTION III
FACILITY INFORMATION

1. GENERAL INFORMATION

Total number of tank systems used to accumulate hazardous waste:	
A. Existing Tank System	
i. Number of tank systems prior to January 12, 1987:	4,800 gallons
ii. Age of these tanks systems:	Unknown
B. New Tank System	
i. Number of new tank systems installed after July 14, 1986:	
ii. Number of tank systems used to accumulate waste after January 12, 1987:	
C. New Waste Tank System	
i. Number of tank systems used to accumulate waste which became hazardous after 12, 1987:	

2. EXISTING TANK SYSTEMS (265.191)

	MEETS REQUIREMENTS			
	YES	NO	N/A	POTENTIAL VIOLATION
A. Number of tank systems which have secondary containment per 265.193(b)?	X			
i. Does the secondary containment system appear to comply with 265.193(b)?	X			
ii. Is an assessment of the secondary containment and tank system on-file?		X		X
B. Assessment of integrity on-file for each year since January 1988 or until secondary containment is provided?		X	X	
Assessment contains:				
i. Found fit for use?		X	X	
ii. Design standards for tank systems?		X	X	
iii. Hazardous characteristics of waste?		X	X	
iv. Age of System?		X	X	
v. Leak test, internal exam or other examination conducted? Specify.		X	X	

SECTION III
FACILITY INFORMATION-CONTINUED

	MEETS REQUIREMENTS			
	YES	NO	N/A	POTENTIAL VIOLATION
vi. Did a P.E. certify the assessment in accordance with [(270.11(d)]?		X		X
C. Did the assessment document the tank system fit for use?		X		X
3. NEW TANK SYSTEM (265.192)				
A. Is this a new tank system installed after January 12, 1987? or		X	X	
Is this an existing tank system used to accumulate hazardous waste after January 12, 1987? or		X	X	
Has a component to an existing tank system been added or substantially changed since January 12, 1987?		X	X	
B. Is secondary containment provided as required by 265.193 (d)?		X	X	
C. Assessment and Certification includes:				
i. Design standards for tank and ancillary equipment?		X	X	
ii. Hazardous characteristics of waste?		X	X	
iii. Corrosion determination? (If applicable)		X	X	
a. Factors affecting potential for corrosions?		X	X	
b. Type of corrosion protection?		X	X	
c. Determination by a corrosion expert?		X	X	
iv. Are underground tanks protected from vehicular traffic?		X	X	
v. Are foundations, etc. structurally sound?		X	X	
D. Was construction/installation of tank system inspected by P.E.?		X	X	

SECTION III
FACILITY INFORMATION-CONTINUED

	MEET REQUIREMENTS			
	YES	NO	N/A	POTENTIAL VIOLATION
F. Is corrosion protection provided?		X	X	
G. Is assessment and certification by P.E. (270.11 d) for all the above items in the facility's file?		X	X	
4. NEWLY DESIGNATED HAZARDOUS WASTE TANK SYSTEMS				
A. Is yearly assessment on file for existing tank systems which accumulate D018-D043, waste?		X	X	
i. Does the new tank system comply with the requirements of Section III (2)? If so, Complete Section III (2).		X	X	
B. Is this a newly constructed tank system used to accumulate D018-D043 waste?		X	X	
i. Does the new tank system comply with the requirements of Section III (3)? If so, Complete Section III (3).		X	X	
5. SECONDARY CONTAINMENT (265.193)				
A. Is the secondary containment in sound condition (no cracks, gaps, leaks, etc.)?	X			
B. Is a leak detection system used which is capable of determining a leak of either the either the primary or secondary containment systems within 24 hour?		X	X	
C. Is the system capable of containing 100% of the largest tank plus precipitation?	X			

SECTION III
FACILITY INFORMATION-CONTINUED

	MEET REQUIREMENTS			
	YES	NO	N/A	POTENTIAL VIOLATION
6. OPERATIONAL REQUIREMENTS/INSPECTIONS				
A. Is there any evidence of ruptures, leak, corrosion, or failure in the tank system or ancillary equipment?		X		
B. Are appropriate controls and practices such as the following used to prevent spills and overflows, from tanks or secondary containment systems?		X		
i. Spills preventions controls (e.g. check valves, dry disconnect coupling, etc.)?	X			
ii. Overfill prevention controls (e.g. level sensing devices, high level alarms, automatic feed cutoff, or bypass to a standby tank?	X			
iii. Maintenance of sufficient freeboard in uncovered tanks to prevent over-topping by wave, wind action or precipitation?		X	X	
C. Does the owner/operator inspect the following, each operating day, where present?	X			
i. Overfill/spill control equipment (e.g. waste-feed cutoff systems, bypass systems, and drainage systems)?	X			
ii. Above ground portions of the tank system to detect corrosion or release of waste?	X			

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SECTION III FACILITY INFORMATION- CONTINUED				
	MEET REQUIREMENTS			
	YES	NO	N/A	POTENTIAL VIOLATION
iii. The construction materials and the area immediately surrounding the externally access portion of the tank system including secondary containment structures, (e.g. dikes) to detect erosion or signs of release or hazardous waste (e.g. wet spot, dead vegetation)?	X			
iv. Remove any accumulated precipitation?	X			
D. Are cathodic protection systems, if present, inspected according to the following schedule:		X	X	
i. Six months after the initial installation to confirm the proper operation of the cathodic protection system, and annually thereafter?		X	X	
ii. Every other month to inspect sources of impressed current?		X	X	
E. Are the inspection results documented in the operating record of the facility?	X			
i. Is the tank system managed in such a way as to protect it from any material or conditions that may cause the waste to ignite or react?	X			
ii. Does the tank system comply with the National Fire Protection Association's Codes?	X			
F. Does this tank system accumulate incompatible waste?		X	X	

RCRA SUBPART CC CHECKLIST FOR
AIR EMISSIONS AT LARGE QUANTITY GENERATORS

Facility Name: **Apollo Industries, Inc.** EPA ID#: **GAD051021285**

Location Address: **1850 S. Cobb Industrial Blvd.** City: **Smyrna**

I. 1. Determine if facility meets the exemptions or exclusions listed below for Subpart CC?

A. If the answer in 1. is yes, what is the reason? 40 CFR 265.1(c) exemptions if:

____ Wastewater treatment unit
____ Elementary neutralization unit
____ Emergency spill or management unit
____ Totally enclosed treatment facility
____ Hazardous waste recycling unit
____ CESQG or SQG
____ Satellite acumulation unit
____ Other exemptions: farmers disposing of pesticide, transporters storing no more than 10 days, universal waste handlers, generator adding absorbent materials to HW containers, or RCRA empty containers.

If yes, not subject to Subpart CC.

B. If the answer in 1. is yes, what is the reason? 40 CFR 265.1080(b) exclusions if:

____ Unit did not receive HW after 12/6/96
____ Using containers of less than 26.4 gallons capacity
____ Tanks and surface impoundments in closure
____ Units used in an on-site RCRA or CERCLA clean-up
____ Mixed Radioactive and hazardous waste
____ Units with CAA, NESHAPS or NSPS controls
____ Tanks with process vents (Subject to Subpart AA)
____ Tanks with organic peroxide manufacturing waste
____ Waste that meets LDRs

If yes, not subject to Subpart CC.

Yes No **X**

The facility does not qualify for an exemption or exclusion from Subpart CC.

2. If no, is the average volatile organic concentration of each waste management unit more than 500 ppmw determined on an annual basis at point of waste origination or cannot prove otherwise?(Review Records) 265.1083(c)(1)

If no, unit not subject to Subpart CC.

If yes, list the number of the units and the concentration in the space below.
4,800 gallon aboveground open top hazardous waste storage tank. The average volatile organic concentration was 1,500 ppmw for trichloroethene by the 8260B analytical dated February 4, 2003.

II. General Determination

1. A. If Knowledge was used, is there any documentation on file? 265.1084(a)(4)(i) ____ Yes __**X**__ No __**X**__ N/A ___ Violation

Check documentation found on file:
____Organic material balances of the source generating, or
____Previous organic constituent test data, or
____Other information (manifests, shipping papers and waste certification notices.)

B. If facility used sampling, was sampling done by an EPA approved method? 265.1084(a)(3)(iii)(A) __**X**__ Yes ___ No ____ N/A __ Violation (Method 25D)

Bold and underline method used 25D, 624, 625, 1624, 1625, **<u>8260(B),</u>** or 8270(C)

C. Does the facility have a written site sampling plan? __**X**__ Yes ___ No ___ N/A __ Violation 265.1084(b)(3)(ii)(C)

D. Has the waste stream changed since the initial waste determination was done which would cause the character of the waste to change or to exceed the threshold levels for applicability of Subpart CC?____ Yes __**X**__ No

E. If yes, was a new waste determination done? ____ Yes ____ No

2. Did the facility install controls on the units that are subject to the Subpart CC rule by December 6, 1996? 40 CFR 265.1082(a)(1) ____ Yes __**X**__No _**X**_ N/A ____ Violation

If answer to question 2 is yes, proceed to III.

If answer to Question 2 is no, then answer these questions.

A. Did the facility have an implementation schedule? 40 CFR 265.1082(2)(ii) ____ Yes __**X**_ No __**X**_ N/A ___ Violation

B. Was it in the operating record by December 6, 1996? ____ Yes __**X**__ No

C. Did the implementation schedule contain the following information 40 CFR 265.1082(2)(i),(ii): ____ Yes _**X**__ No _**X**__ N/A ___ Violation
  (1) Why installation could not be completed by 12/6/96
  (2) Show dates by which design and construction will be initiated & completed, and include supporting information, e.g., contract awards,purchase orders and performance tests.
  (3) Install equipment as soon as possible, but no later than 12/8/97.

D. Is facility meeting implementation schedule? ____ Yes __**X**__No __**X**_ N/A ___ Violation

E. If no, is there documentation in the operating record that any schedule change cannot reasonably be avoided? ____ Yes __X__ No

F. Has the Regional Administrator extended the compliance schedule beyond 12/8/97, or was such a request submitted? 265.1082(b)(2)(iii)

____ Yes __X__ No __X__ N/A ____ Violation

III. How is the waste managed? Circle Tank or Container then go to and complete that Section.

A. <u>TANKS</u>

1. Is HW having an average VO concentration of more than 500 ppmw placed in a tank with **level 1 control**? 40 CFR 265.1085(b)(1) ___X_ Yes ____ No ____ N/A _X___ Violation

Note: Tank must meet 3 conditions for level 1 control:

(1) Waste maximum organic vapor pressure less than cutoff for tank design capacity (see table below from 265.1085(b)(1)(i)(A), (B), & (C))

(2) No heating to or above temperatures at which vapor pressure is determined

(3) No waste stabilization in tank

Tank Design Capacity (gallons)	Waste Maximum Organic Vapor Pressure (psi)
>= 39,950	< 0.75 (39mm)
>= 19,840 but < 39,950	< 4.0 (207mm)
< 19,840	< 11.1 (575 mm)

<u>Fixed Roof</u> (Level 1) 265.1085 (c)(2)(i)

______ Fixed Roof is stationary or a continuous barrier over entire surface area.

______ No visible cracks, holes, gaps, or other open spaces between roof section joints or between the interface of the roof edge and wall tank.

<u>Fixed Roof Openings Can Be Equipped with:</u>

_____ Closure device if designed with no cracks in closed position.

_____ Permanent openings if vented to an organic emission control device.

_____ Pressure relief device (conservation vent) that are vented to atmosphere.

Level 1 - Fixed Roof Operating Requirements:

_____ Cover and/or closure devices must be closed at all times except during sampling, inspections, maintenance or other normal operations.

<u>Level 1 Inspections</u>

_____ Completed on or before tank subjected to Subpart CC 12/6/96.

_____ Once/yr. Thereafter except when inspection or monitoring is unsafe.

If level 1 criteria are not met, level 2 controls are needed. 265.1085(d)

2. Is HW having an average VO concentration of 500 ppm or more being placed in a tank with **level 2 controls**? ____ Yes ____ No

265.1085(b)(2)

Level 2:
Check the level 2 controls used:
____ (1) fixed roof with internal floating roof;
____ (2) external floating roof;
____ (3) a cover vented to a control device;
____ (4) a pressure tank; or
____ (5) keep the tank inside a total enclosure vented to a combustion control device
(Go to applicable section)

Note: Waste transfers to tank from another tank or surface impoundment subject to CC controls must be in hard-piping or other closed system.

B. **CONTAINER STANDARDS** (265.1087)

1. Three levels of acceptable controls

a. **Level 1**- For containers larger than 0.1 cubic meters (26.4 gallons) and less than or equal to 0.46 m^3 (about 119 gallons), or containers greater than this size but **DOES NOT** contain organic waste in light material service." Container level 1 controls are one of the following::

(1) Use container that meets DOT regulations (49 CFR Part 178 or 179), **or**
(2) Use covered container and closure devices on the container to ensure that there are no visible gaps into the interior of the container, **or**
(3) Use organic-vapor suppressing barrier on or above the hazardous waste in an open-top container.

Do their containers meet level 1 controls? 265.1087(c) __X__ Yes ____ No ____ N/A ____ Violation

Do containers meet closure requirements? __X__ Yes ____ No ____ N/A ____ Violation
Any defects ____ Yes __X__ No ____ N/A ____ Violation
Are repaired within 24 hrs ➔5 days ____ Yes ____ No ____ N/A ____ Violation

** "Light material service" means the vapor pressure of one or more of the organic constituents is >0.3 Kilopascals (kPa) at 20° C; AND the total concentration of pure organic constituents with vapor pressures > 0.3 Kilopascals (kPa) at 20 ° C is equal to or greater than 20% by weight.

No recordkeeping requirements for containers using Level 1 controls, other than for the "light material service" determinations.

b. **Level 2** - For containers larger than 0.46 cubic meters (greater than 119 gallons) size and are managing hazardous waste in light material service. Container level 2 controls are one of the following:

(1) Use container that meets DOT regulations (49 CFR Parts 178 or 179), **or**
(2) Use container that operates with no detectable organic emissions as tested using Method 21 of 40 CFR Part 60, Appendix A, (organic vapor analyzer) **or**
(3) Use container that is vapor tight as tested within last 12 months using Method 27 of 40 CFR Part 60, appendix A (lock and load pressure tightness test).

Waste transfer requirements for level 2 controls:

(1) Submerged-fill pipe or other submerged-fill method, **or**
(2) Vapor-balancing sytem or a vapor recovery system, **or**
(3) Fitted opening in the top of a container through which the hazardous waste is filled, and purging the transfer line before removing it from the container opening.

No recordkeeping requirements for containers using Level 2 controls, other than for the "light material service" determinations.

Inspections

Do their containers meet Level 2 controls? 265.1087(d) ____ Yes __X__ No __X__ N/A ____ Violation

Do containers meet closure requirements? ____ Yes __X__ No __X__ N/A ____ Violation

Any defects? ____ Yes __X__ No __X__ N/A ____ Violation

Repaired within 24 hrs ⇨ 5 days ____ Yes __X__ No __X__ N/A ____ Violation

c. **Level 3** - For any container greater than $0.1m^3$ (26.4 gallons) used to treat hazardous waste by stabilization, container level 3 control alternatives are one of the following:

(1) Place the open container inside a total enclosure (Procedure T - 40 CFR 52.741, Appendix B) vented directly to a combustion control device, **or**

(2) Vent the container opening through a closed vent system to a control device.

Recordkeeping:

(1) Annual measurement records for enclosures using Procedure T criteria.
(2) Inspection records for the closed-vent system and control device. (same for those used on tanks)

- visual inspection for defects
- on or before the date the tank is subjected to Subpart CC requirements
- once/yr except when inspection and monitoring is unsafe

Do their containers meet Level 3 controls? 265.1087(e) ____ Yes __X__ No __X__ N/A ____ Violation

NOTE: Most facilities will be in compliance if they store their waste in DOT approved 55-gallon drums.

s:\rdrive\John\Apollo 03 Subpart CC.doc

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Georgia Department of Natural Resources
2 Martin Luther King, Jr. Dr., SE, Suite 1154-E, Atlanta, Georgia 30334
Chris Clark, Commissioner
Environmental Protection Division
Carol A. Couch, Director
Hazardous Waste Management Branch
Phone 404-656-7802 FAX 404-651-9425

Trip Report

October 1, 2009

SITE NAME AND LOCATION:	Apollo Technologies 1850 S. Cobb Industrial Blvd. Smyrna Cobb County, Georgia
EPA ID NUMBER:	GAD051021285
TRIP BY:	Amanda Howell, Environmental Engineer
ACCOMPANIED BY:	John Fonk, Unit Coordinator Becky Ferguson, Geologist
DATE OF TRIP:	September 11, 2009
OFFICIALS CONTACTED:	Maria Callas, President Ian Johnston, Vice President Denny Dobbs, Dobbs Environmental
REFERENCE:	Consent Order EPD-HW-1186

COMMENTS:

The purpose of this trip was to conduct an announced Compliance Evaluation Inspection (CEI) at the Apollo Technologies facility (Apollo) located in Smyrna, Georgia in follow-up to a proposed Consent Order issued on June 15, 2009. Apollo submitted a response to EPD regarding the proposed order on August 14, 2009.

Apollo is a large quantity hazardous waste generator. Apollo manufactures various organic and water based solvent cleaners, pesticides, and janitorial aerosol products. We arrived at 9:00 am and met with Ms. Maria Callas, Mr. Ian Johnston, and Mr. Denny Dobbs. During a brief introductory meeting, we were informed that flash photography is not allowed inside the facility and along certain areas outside. According to Mr. Johnston, the flash interferes with the fire and explosion safety system. We utilized a disposal camera without a flash because of this issue. However, the pictures taken inside the building were too dark and are therefore not attached with this trip report. After the brief meeting, Mr. Dobbs accompanied Ms. Ferguson to the on-site wells to observe groundwater sampling procedures as part of the semi-annual sampling event. Mr. Johnston and Ms. Callas escorted Mr. Fonk and myself during the site inspection.

Docket No 769150

tray had a rack that kept the container elevated above any potential releases. Mr. Johnston stated the container was used when the line required flushing. After the flushing process was finished, the container was emptied into the 250-gallon tote located in the batch room. An additional catch tray was observed placed at each line. Mr. Johnston stated the containers are only placed along the line when flushing is needed.

A new machine has been added to one of the production lines since the last site inspection. The line is now divided into two parts: solvent and reagent. Apollo currently reuses the product after flushing the system. Prior to the changes, the solvent and reagent would have mixed together making the flush waste unusable. The new system allows for reuse of the product and reduces hazardous waste at the facility.

The Water Bath Recirculating System is also located within the Main Production Area. Water is used to heat and clean the spray cans. The heating process tests the pressurization of the spray cans. Defective cans are removed from the production line. When the water is determined to be too dirty to recycle, the wastewater is placed into the 250-gallon hazardous waste tote located in the batch room.

A trash bin style container with lid labeled "Satellite Solid Waste Collection Point" was observed inside the Main Production Area. Mr. Johnston informed us that the container was used to collect "solid" hazardous waste. Inside the container were several rags used for wiping down the machines. Mr. Johnston informed us that he divides Apollo's hazardous waste into liquid or "solid" waste. We explained to Mr. Johnston the definition of solid waste and hazardous waste under 40 CFR 260 and requested he change his label to state hazardous waste. If he wants to distinguish between liquid or "solid" waste, we recommended that he write out the type of waste on the container (i.e. rags, mop heads, etc.). Mr. Johnston had the label changed while the site inspection was being conducted. An additional trash bin style container was observed at the entrance into the Batch Room. By the time we observed this hazardous waste container, Mr. Johnston had already had the container's label corrected.

A new mixing tank has been added to the Batch Room since the last site inspection. All mixing tanks are connected to production lines by using soft flexible hoses. Mr. Johnston explained that they don't use hard lines because the soft hoses allow them to use different mixing tanks for different products. How much product is needed determines the size of mixing tank used. The mixing tanks are flushed out after use. The flush wastewater is collected in buckets and then dumped into the 250-gallon hazardous waste tote located in the Batch Room. According to Mr. Johnston, they use buckets so they can visibly see the flush water to know when it is clear.

Two (2) 55-gallon containers were located within the batch room. The containers were labeled "reclaimed material" and one of the containers had a puncturing device attached to the bunghole. Mr. Johnston informed us that the contents of spray cans, which do not meet the pressure test of the Water Bath Recirulating System, are placed into these containers and then put back into the mixing tank and reused in the system.

The former sump tank, discussed during the last site inspection and located in the Batch Room, has been filled in with concrete. The area covering the sump tank now has a

A drip pan was observed under the hard pipes located in the main Truck Loading Area and drip pans were observed stored next to the hard pipes. According to Mr. Johnston and Ms. Callas, the stored drip pans are placed under the pipe connection on the truck during delivery. A berm has been constructed in this area since the last site inspection (Photograph 5). According to Mr. Johnston, the bermed area can hold up to 40 gallons in the event of a release. Mr. Johnston stated that after 40 gallons the truck's emergency shut off system would activate.

A second Truck Loading Area is located to the west of the primary loading area. Acetone is delivered at this second loading area. A drip pan was observed under the hard pipes. Since the last site inspection this loading area has been redesigned with a newly constructed berm and sump (Photograph 6). A storm drain is located immediately adjacent to the loading area (Photograph 7). Mr. Johnston stated that a rubber stopper is plugged into the stormwater culvert and pressure sealed when a truck is unloading in this area (Photograph 8). According to Mr. Johnston, if a release is observed, the sump is pumped into a 55-gallon hazardous waste container. Mr. Johnston stated that rainwater from storms is pumped from the sump into the storm drain. Mr. Johnston informed us that drip pans stored at the primary Truck Loading Area are also used at this area. According to Ms. Callas and Mr. Johnston, truck deliveries in this loading area occur weekly.

The former hazardous waste storage area has been reworked since the 2008 CEI site inspection (Photograph 9). According to Mr. Johnston, only empty containers are now stored in this area. The height of the secondary containment wall surrounding the area has also been increased. The 2008 CEI site inspection trip report identified five 55-gallon containers outside of the southern concrete block secondary containment wall. At the time of this site inspection, no containers were observed in this area (Photograph 10). One container labeled as "empty" was observed behind the western containment wall; however, Mr. Johnston had an employee remove the container immediately. Grass was also visible in areas that were previously void of vegetation.

Several improvements both functional and cosmetic were observed at the back portion of the Bulk Storage Area and along the back of the main process building. A concrete pad was repaired at the storm water culvert point of discharge (Photograph 11). The concrete secondary containment structures were painted (Photograph 12). New grass was planted along the back of the facility (Photograph 13). The back door stairs have been painted and shrubbery was planted surrounding the stairs (Photograph 14). The 2008 CEI site inspection trip report identified stains at the back door stairs and mops placed over the rail.

Concrete patch had been applied along the side of one of the secondary containment walls in the Bulk Storage Area (along the run-off area). According to Mr. Johnston, a hole was made in the concrete block wall to determine if product had been released underneath the secondary containment area. Mr. Johnston further stated that samples were collected prior to resealing the hole. During the 2008 CEI site inspection, a pipe was identified at the back corner of the bulk storage secondary containment basin. According to Mr. Johnston, the pipe was a weephole. The pipe has been removed and the

OFFICE OBSERVATIONS:

The records review included the following:

- Contingency Plan
- Hazardous Waste Inspection Logs
- 2008 and 2009 Hazardous Waste Manifests
- Training Records
- Former Sump Tank Integrity Test
- Tank Certification on Hazardous Waste Tank

The training records were unclear regarding which employees received what level of training. We recommended they revise their Standard Operation Procedures (SOP) to identify which positions receive additional training.

The tank certification was dated November 3, 2003. The certification was signed by licensed engineer Mr. Donald Shaver, License # 18807.

The former sump tank integrity test was conducted over the weekend (August 22-25, 2008) by an Apollo employee. The description of the testing procedure as provided to EPD by Mr. Johnston is attached.

Observations noted during the current inspection were discussed with Ms. Callas and Mr. Johnston prior to leaving the facility.

ATTACHMENTS:

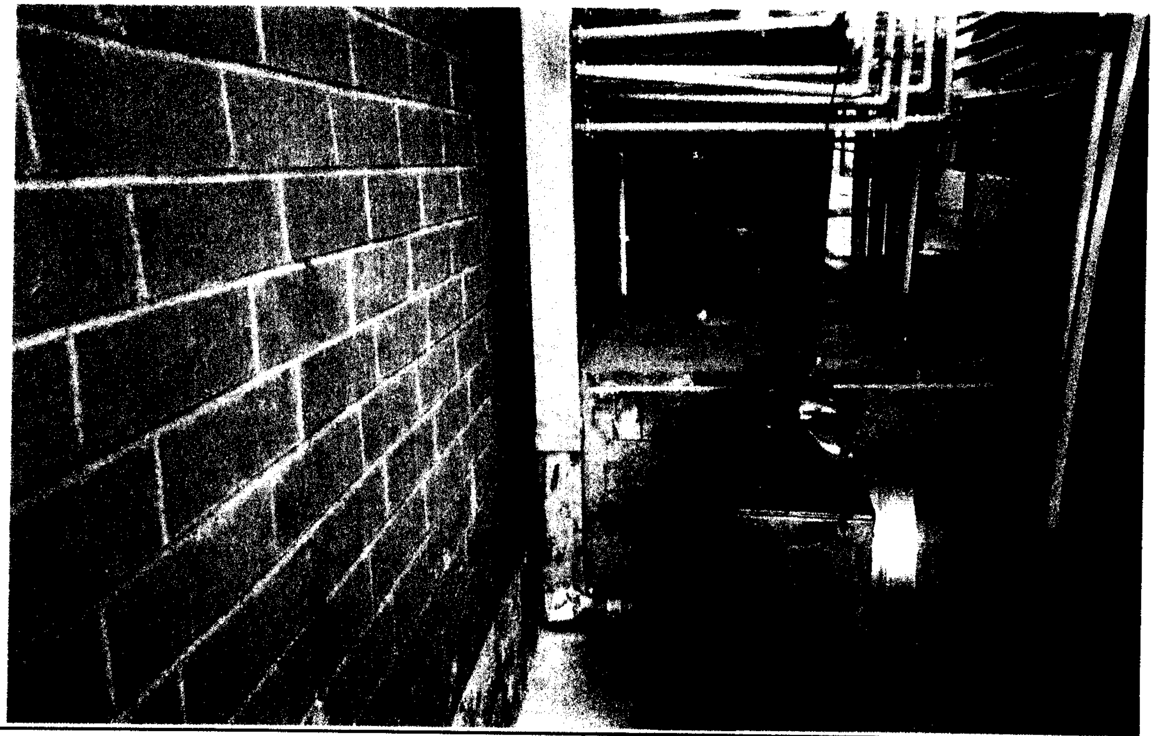
Photographs (20)
Former Sump Tank Integrity Test

RECOMMENDATIONS/FOLLOW-UP:

Send a Revised Proposed Consent Order

REVIEWED BY:

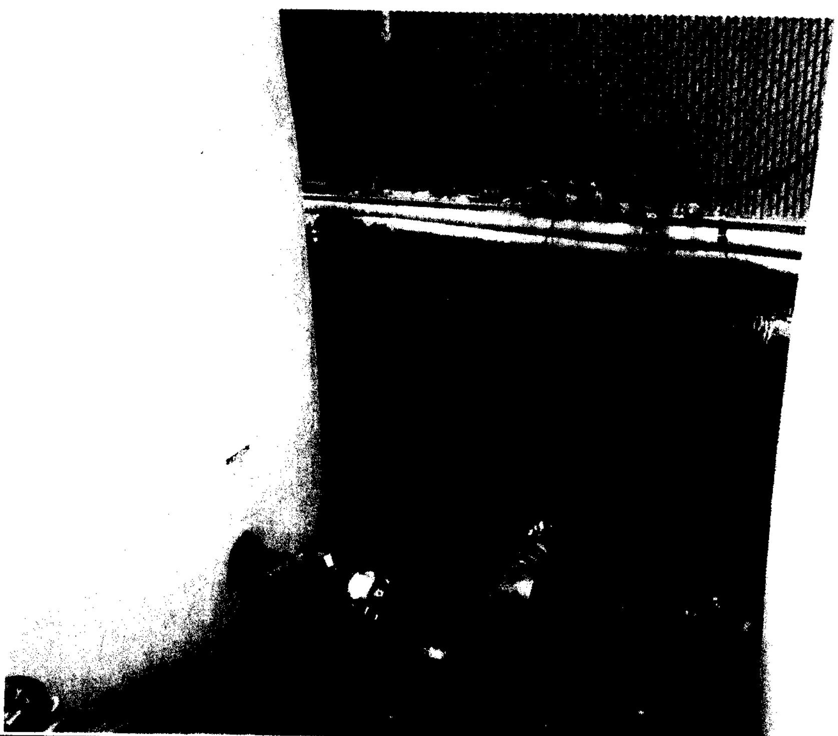
____
John Fonk, Unit Coordinator



Site Name: Apollo	Photo 1 of 20	Smyrna, GA	County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch		
Explanation: View of black corrugated hose connected to the drain pipe			

Site Name: Apollo	Photo 2 of 20	Smyrna, GA	County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch		
Explanation: View of stains observed on the floor of the Bulk Storage Area			

Site Name: Apollo	Photo 3 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of 3 SVE wells located between the 2 secondary containment basins in the Bulk Storage Area		



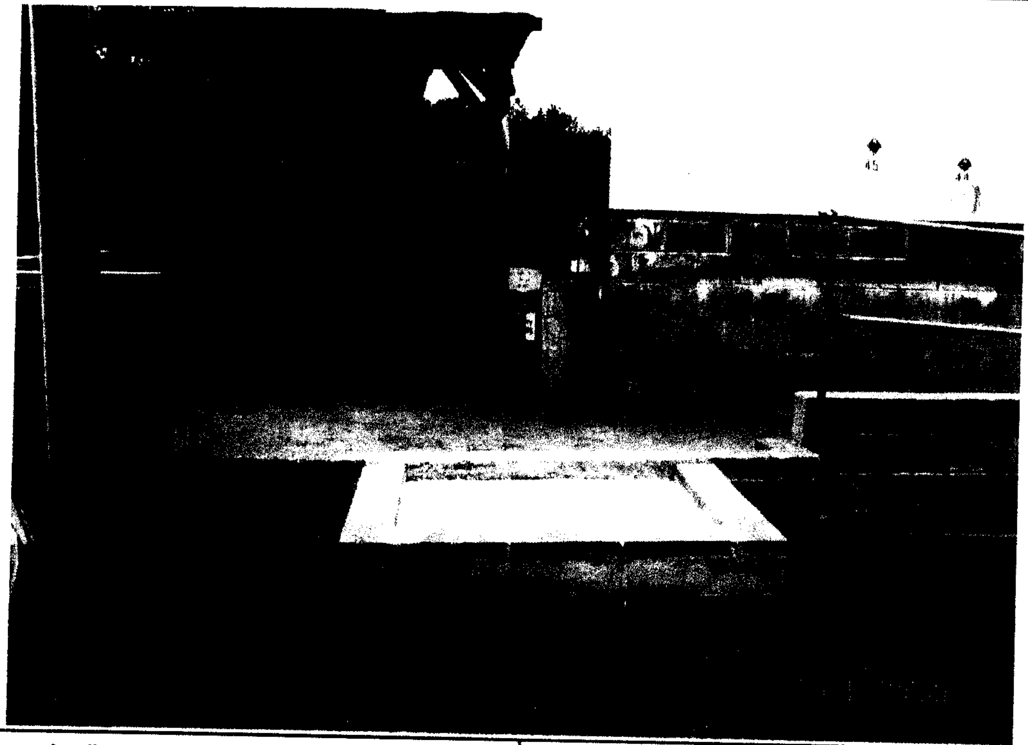
Site Name: Apollo	Photo 4 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of a SVE well located within one of the secondary containment areas at the Bulk Storage Area		

Site Name: Apollo	Photo 5 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of main Truck Loading Area		

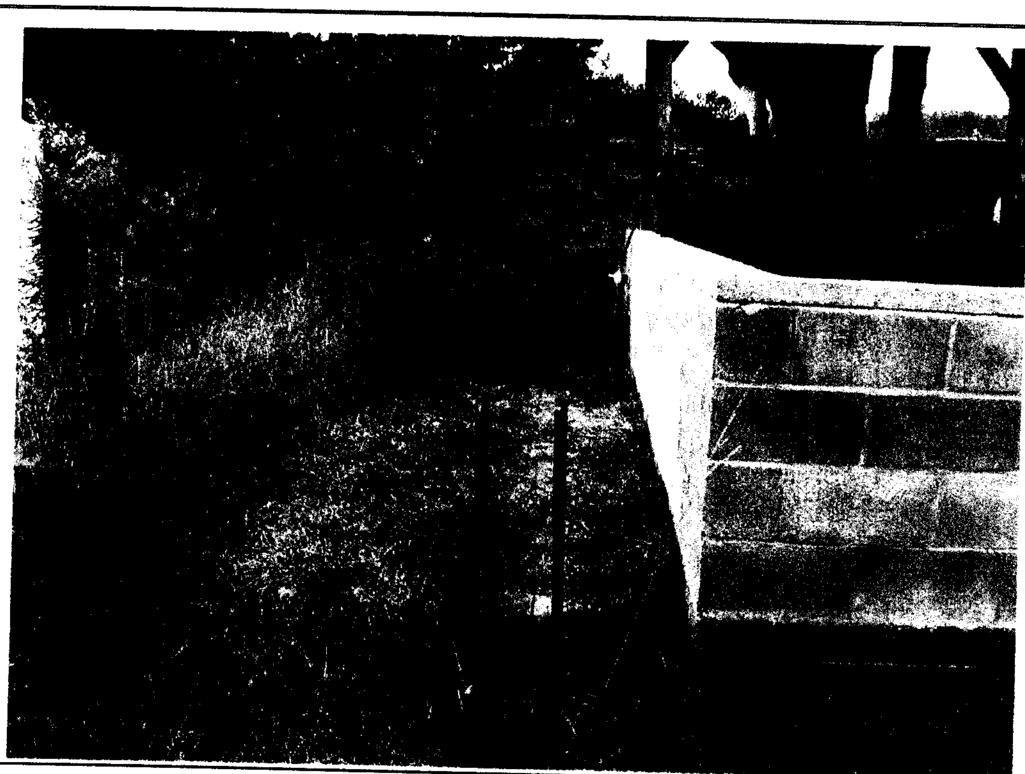
Site Name: Apollo	Photo 6 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of secondary Truck Loading Area, note acetone is delivered at this loading area.		

Site Name: Apollo	Photo 7 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of storm drain located immediately downgradient of secondary Truck Loading Area		

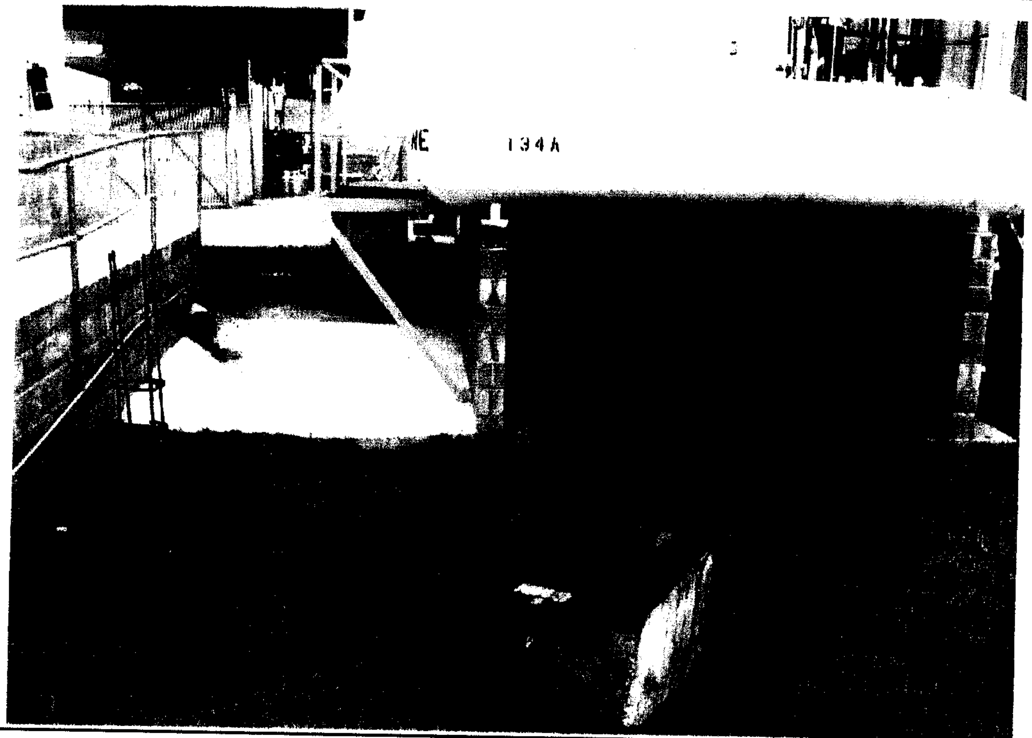
Site Name: Apollo	Photo 8 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of rubber stopper plugged into stormwater culvert		



Site Name: Apollo	Photo 9 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: Former Hazardous Waste Storage Area, only empty containers are stored here now.		



Site Name: Apollo	Photo 10 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of area immediately south of the former Hazardous Waste Storage Area		

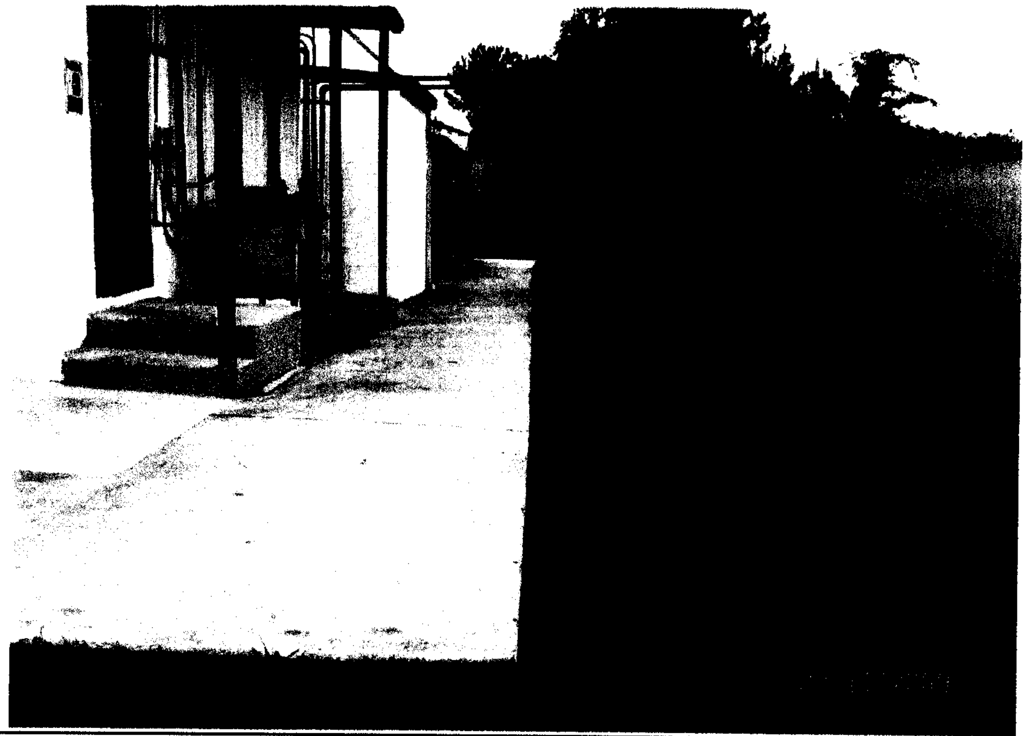


Site Name: Apollo	Photo 11 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	

Explanation: View of repaired concrete pad at storm water culvert

Site Name: Apollo	Photo 12 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	

Explanation: View of newly painted secondary containment structure, note arrow indicates concrete patch location



Site Name: Apollo	Photo 13 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	

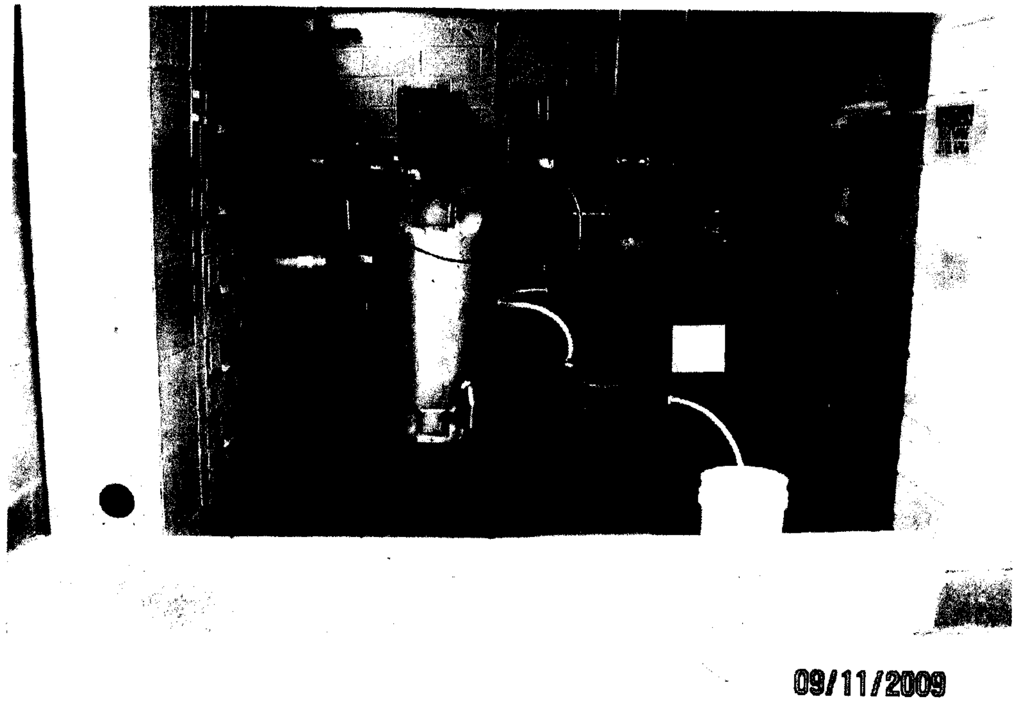
Explanation: View of back of main production building, note the newly planted grass since the last site inspection.

Site Name: Apollo	Photo 14 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	

Explanation: View of newly painted back door stairs and newly landscaped surrounding area.

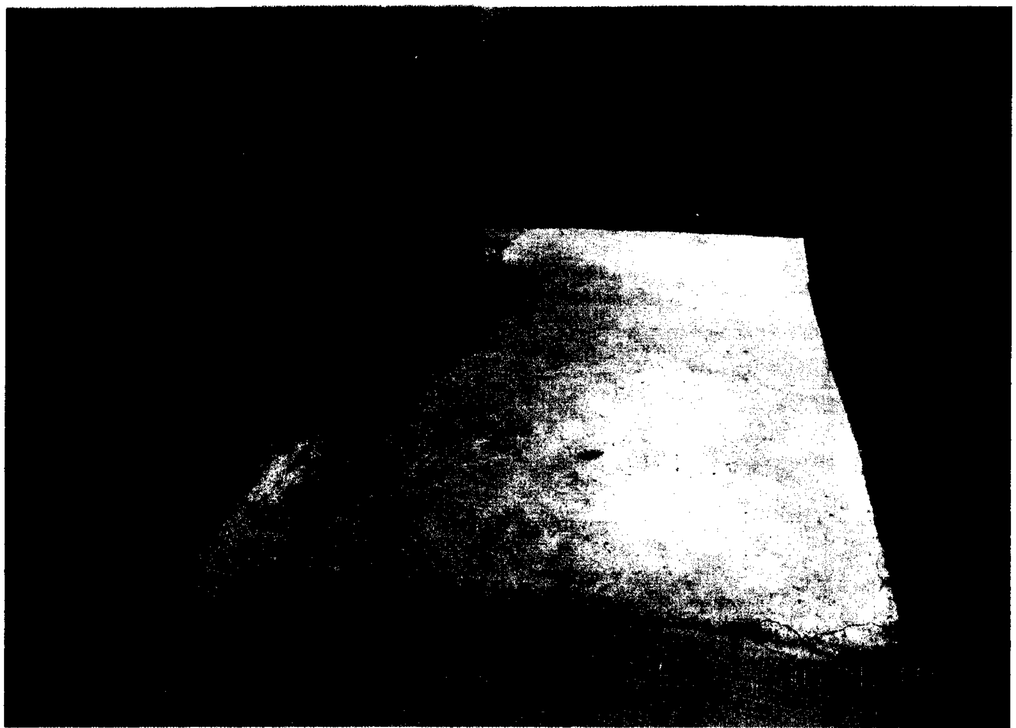
Site Name: Apollo	Photo 15 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of sheen observed on water flowing towards the on-site storm water drain		

Site Name: Apollo	Photo 16 of 20	Smyrna, GA County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch	
Explanation: View of Groundwater Treatment System		



Site Name: Apollo	Photo 17 of 20	Smyrna, GA	County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch		
Explanation: View of Air Compressor Room			

Site Name: Apollo	Photo 18 of 20	Smyrna, GA	County: Cobb
Date: September 11, 2009	Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch		
Explanation: View of Oil/Water Separator, note Hazardous Waste Container (white container) is open.			



Site Name: Apollo | Photo 19 of 20 | Smyrna, GA | County: Cobb

Date: September 11, 2009 | Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch

Explanation: View of newly constructed berm and extended walkway outside of the Air Compressor Room

Site Name: Apollo | Photo 20 of 20 | Smyrna, GA | County: Cobb

Date: September 11, 2009 | Photographer: Amanda Howell, Hazardous Waste Mgmt. Branch

Explanation: View of sump located in the Air Compressor Room

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

FEB 10 2011

Mr. Mark Smith, Chief
Hazardous Waste Management Branch
Environmental Protection Division
Georgia Department of Natural Resources
Two Martin Luther King, Jr. Drive
Suite 1154 East
Atlanta, Georgia 30334

SUBJ: RCRA Compliance Evaluation Inspection
Apollo Technologies, Inc.
EPA ID Number GAD 051 021 285

Dear Mr. Smith:

On December 13, 2010, the Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (GAEPD) conducted a Resource Conservation and Recovery Act (RCRA) Compliance Evaluation Inspection (CEI) at the Apollo Technologies, Inc. Smyrna, Georgia, to determine the facility's compliance status with RCRA.

Enclosed is the EPA RCRA CEI report, which indicates that violations of RCRA were discovered. If you have any questions regarding the inspection, please contact Javier García, of my staff, by phone at (404) 562-8616 or by e-mail at garcia.javier@epa.gov.

Sincerely,

Bill Truman, Acting Chief
South Enforcement and Compliance Section
RCRA and OPA Enforcement and Compliance Branch

Enclosure

Docket No. 769153

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

FEB 10 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Maria Theo-Callas, Chief Executive Officer
Apollo Technologies, Inc.
1850 S. Cobb Industrial Blvd.
Smyrna, Georgia 30082

SUBJ: RCRA Compliance Evaluation Inspection
Apollo Technologies, Inc.
EPA ID Number GAD 051 021 285

Dear Ms. Theo-Callas:

On December 13, 2010, the Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (GAEPD) conducted a Resource Conservation and Recovery Act (RCRA) Compliance Evaluation Inspection (CEI) at the Apollo Technologies, Inc. Smyrna, Georgia, to determine the facility's compliance status with RCRA.

Enclosed is the EPA RCRA CEI report, which indicates that possible violations of RCRA were discovered during the inspection. Please note that EPA has agreed with GAEPD, to take the lead on the follow-up of the observations made during the inspection. In addition to the inspection report, we are enclosing an information sheet that EPA developed for small businesses in response to the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. If you have any questions regarding the report, please contact Javier García, of my staff, by phone at (404) 562-8616 or by e-mail at garcia.javier@epa.gov.

Sincerely,

Bill Truman, Acting Chief
South Enforcement Section
RCRA and OPA Enforcement and Compliance Branch

Enclosures

cc: Mr. John Fonk, GAEPD

RCRA Inspection Report

1) Inspector and Author of Report

Javier E. García
Environmental Engineer

2) Facility Information

Apollo Technologies, Inc.
1850 S. Cobb Industrial Blvd.
Smyrna, Georgia

EPA ID NUMBER: GAD 051 021 285

NAICS Code: 325998 - All Other Miscellaneous Chemical Product and Preparation Manufacturing

3) Responsible Official

Maria Theo-Callas, Chief Executive Officer
(770) 433-0210

4) Inspection Participants

Maria Theo-Callas, Apollo Technologies, Inc.
Ian Johnston. Apollo Technologies, Inc.
Javeed Syed, Apollo Technologies, Inc.
Amanda Howell, Georgia Environmental Protection Division (GAEPD)
Becky Ferguson, GAEPD
Araceli Bonilla, United States Environmental Protection Agency (US EPA)
Javier Garcia, US EPA

5) Date and Time of Inspection

December 13, 2010
10:30 AM

6) Applicable Regulations

Resource Conservation and Recovery Act (RCRA) Sections 3002, 3004, 3005 and 3007, (42 US Code – Annotated U.S.C.A. §§ 6922, 6924, 6925 and 6927), 40 Code of Federal Regulations (C.F.R.) Parts 260-266, 270, 273, 279, adopted and incorporated by reference in Chapter 391-3-11 of the Georgia Rules for Hazardous Waste Management (GRHWM).

7) Purpose of Inspection

This was an EPA oversight comprehensive evaluation inspection (CEI) to determine Apollo Technologies, Inc.'s (Apollo) compliance with all applicable State and Federal RCRA regulations.

8) Facility Description

Apollo is in the South Cobb Industrial Park, in an area classified by Cobb County as "Heavy Industrial." The property covers about 2.2 acres and includes one manufacturing building and an office building. The facility is connected to the public water supplying system and sewage collection system.

Apollo manufactures, by contract, several organic and water based solvent cleaners, pesticides, and janitorial aerosol products for different companies. All products are made in batches, based on clients needs. The product's ingredients are mixed in aboveground blending tanks and transferred to one of four filling stations. From the filling stations, the aerosol cans are tested, labeled and packaged for distribution. The facility has about 60 employees and operates one shift, five days a week.

Apollo is registered as a large quantity hazardous waste generator. All hazardous waste generated at the facility are stored in a 7,500-gallon above-ground steel tank. The hazardous wastes generated at the facility consist of filling lines drippings, off-spec products that cannot be reformulated and blending tanks rinsate. Apollo uses small containers (not larger than 10 gallons) as satellite accumulation area (SAA) containers. The hazardous wastes collected in the SAAs are hand carried to the blending room and poured into a 20-gallon container. Once in the 20-gallon container, the hazardous waste is pumped to the 7,500-gallon storage tank. Apollo classifies their waste stream as D001/D035//F001/F002/F003/F005 hazardous waste.

9) Previous Inspection Summary

On September 11, 2009, GAEPD inspected Apollo. At that time, Apollo was using a 250-gallon sump as part of their hazardous waste storage tank system. GAEPD alleged that Apollo was not operating the sump in compliance with the standards in subpart J of 40 C.F.R. Part 265, as they apply to ancillary equipment of hazardous waste storage tank systems. On July 6, 2010, GAEPD issued to Apollo an Administrative Order (Order) for violations to the Georgia Hazardous Waste Management Act including illegal disposal of hazardous waste and failure to operate a hazardous waste sump in compliance with RCRA requirements. The Order requires Apollo to correct all violations and to submit a Site Assessment Work Plan.

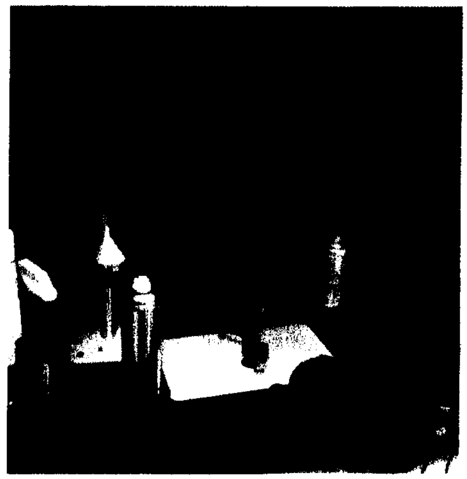
10) Findings

After introductions and presentation of the credentials, the inspectors explained the purpose of the inspection. After a brief description of the activities conducted at Apollo, the inspection team toured the facility. The following are the observations made during the inspection:

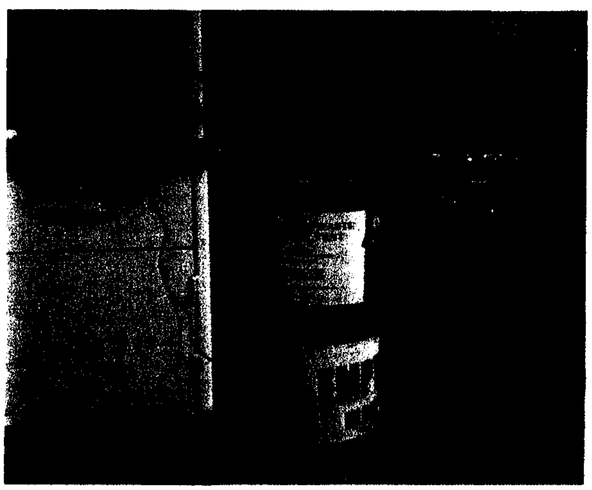
Research and Development Laboratory/Quality Control Laboratory

The laboratories are contiguous and operated by the same personnel. In two fume ventilation hoods, Apollo tests aerosol cans by spraying product into cutoff 1-gallon metal containers. These containers were not labeled and were not kept closed (Pictures 1 – 2). Adjacent to the fume ventilation hoods, Apollo had one 5-gallon container for the consolidation of the waste collected in the 1-gallon containers. The 5-gallon container was labeled, but not closed (Pictures 3 – 4).

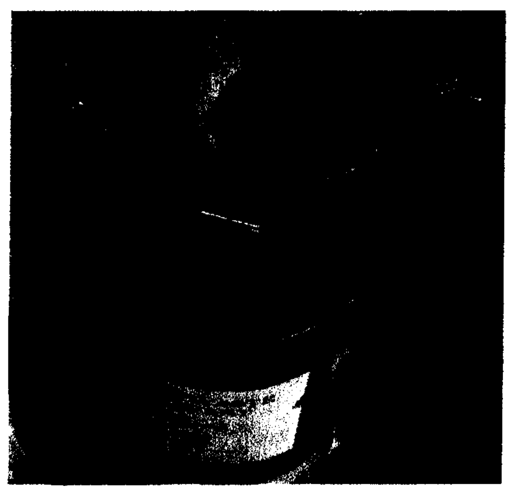
Picture 1: Cutoff containers used to accumulate off-spec product from aerosol quality control testing



Picture 2: Cutoff container used to accumulate off-spec product from aerosol quality control testing



Picture 3: Five-gallon SAA container for off-spec product generated in the R&D Lab/QA&QC Labs.



Picture 4: Top view of the open top five-gallon SAA container for off-spec product generated in the R&D Lab/QA&QC Labs.

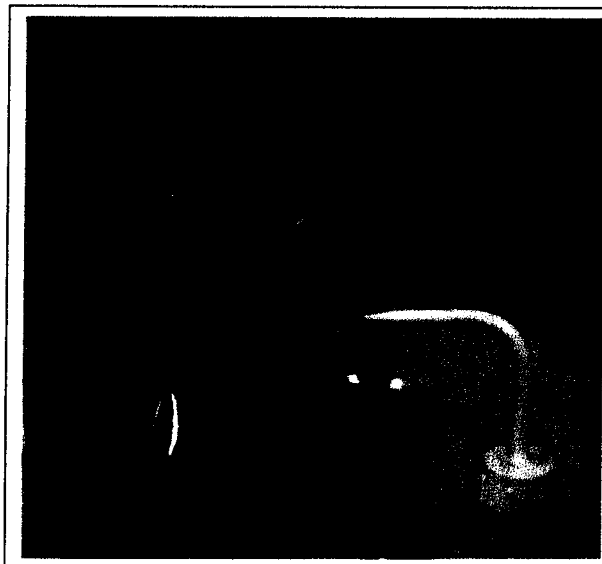
Apparent Violations:

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(ii). 40 C.F.R. § 262.34(c)(1)(ii) requires that a container holding hazardous waste must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. At the time of the inspection, Apollo had three hazardous waste accumulation containers that were not marked. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(i), which incorporates 40 C.F.R. § 265.173(a). 40 C.F.R. § 265.173(a) requires that a container holding hazardous waste must be always closed, except when adding or removing waste. At the time of the inspection, Apollo had four hazardous waste accumulation containers that were open when no waste was being added to or removed from the containers. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

HP Analytical Laboratory

In this laboratory, Apollo tests standards in a gas chromatograph (GC). The spent isopropyl alcohol generated from the operation of the GC unit is accumulated in a 4 liter glass bottle. At the time of the inspection, the SAA container was properly closed and labeled (Picture 5). As illustrated in Picture 5, the container was dated with the accumulation start date. The inspectors indicated to Ms. Callas that SAA containers are not required to be dated until the amount of hazardous waste in the SAA exceeds 55 gallons.



Picture 5: Spent isopropyl alcohol accumulation container located in the HP Analytical Laboratory.

Batch Room

The Batch Room is in the western side of the manufacturing building. This room houses the aboveground tanks where the product ingredients are mixed. When needed, Apollo rinses the mixing tanks with isopropyl alcohol and collects the tanks' rinsate in small containers that are immediately emptied into a 20-gallon plastic container kept in the room (Picture 6). In addition to the rinsate from the blending tanks, Apollo uses the 20-gallon container as the collection point for all other hazardous waste generated at the facility. Therefore the container is subject to the requirement applicable to the 90-day storage areas. At the time of the inspection, the 20-gallon container was on a self-contained pallet. The container was properly labeled, closed and dated (12/10/10). Also in this room, Apollo had a partially full mop bucket with liquids spilled in the area. The container was not closed or labeled. Ms. Callas indicated that the liquid from the bucket is poured into the 20-gallon hazardous waste container.

Picture 6: Hazardous waste consolidation container/pump station in the Batch Room.

Apollo representatives indicated that due to the variety of products produced at the facility, they manage all rinsates as hazardous wastes with the hazardous waste codes D001/D035//F001/F002/F003/F005. Facility personnel explained that once the container is full, the operator connects a hose to the container and pumps the waste to the 7,400 gallon hazardous waste storage tank (Picture 7).

Picture 7: Pump used to transfer hazardous waste from the accumulation container to the hazardous waste storage tank.

Apparent Violations:

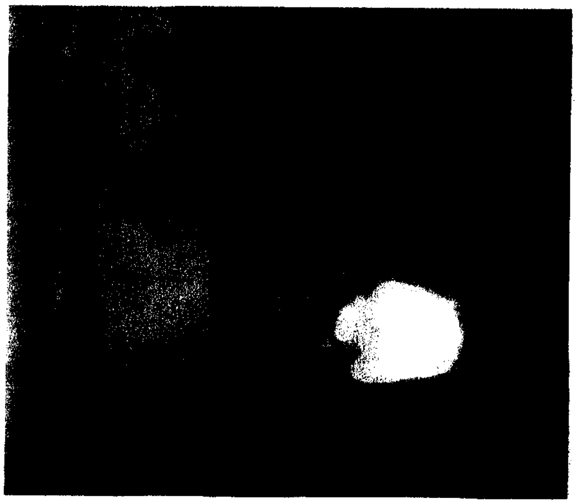
It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(ii). 40 C.F.R. 262.34(c)(1)(ii) requires that a container holding hazardous wastes must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. At the time of the inspection, the mop bucket observed in the Batch Room was not properly marked. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(i), which incorporates 40 C.F.R. § 265.173(a). 40 C.F.R. § 265.173(a) requires that a container holding hazardous must wastes be always closed, except when adding or removing waste. At the time of the inspection, the mop bucket observed in the Batch Room was open when no waste was being added to or removed from the container. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

Product Filling Lines

All four filling lines were observed during the inspections. Each line had a metal pad to collect drippings from the lines. In addition to the drip pans, Apollo was using 5-gallon open top containers to collect drippings from the filling tanks. As with the rinsates from the mixing tanks, Apollo manages all drippage generated at the filling stations as D001/D035/F001/F002/F003/F005 hazardous waste.

At the time of the inspection, none of the accumulation containers or the drip pads were marked with the words "Hazardous Waste" or with a description of the wastes that were being accumulated in them (Pictures 8 – 11). (Note: Due to the fire suppression equipment in the area, no flash was used when taking the pictures. Therefore, the quality of some pictures was compromised.)



Picture 8: Top view of the drip containment metal pan under Line 1.

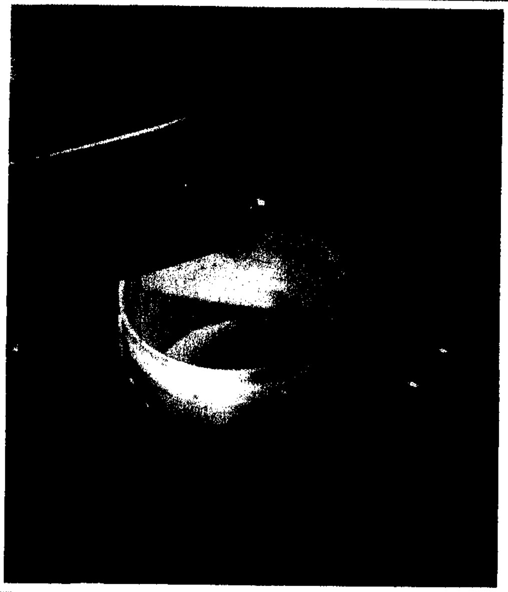
Picture 9: Unlabeled open top container collecting drips from filler tank in filling line #3.

Apparent Violations:

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(ii). 40 C.F.R. § 262.34(c)(1)(ii) requires that a container holding hazardous wastes must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. At the time of the inspection, Apollo had three 5-gallon containers and three drip containment pads that were not properly marked. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(i), which incorporates 40 C.F.R. § 265.173(a). 40 C.F.R. § 265.173(a) requires that a container holding hazardous waste must be always closed, except when adding or removing waste. At the time of the inspection, Apollo had three hazardous waste accumulation containers that

were open when no waste was being added to or removed from them. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.



Picture 10: Unlabeled open top container collecting drips from filler tank in Line 4.

Picture 11: Unlabeled open top container with drippages from Line 1.

Hazardous Waste Storage Tank:

The hazardous waste storage tank is outside the production building in the western side of the property. The tank has secondary containment. At the time of the inspection, the tank was properly identified and dated. No evidence of releases was observed in the containment area.

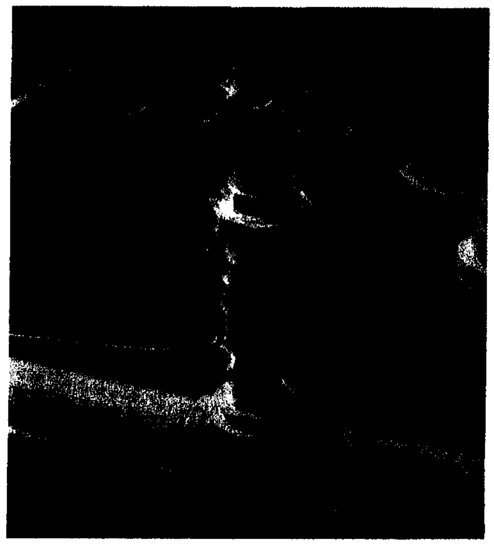
Apollo had not determined whether or not the waste managed in the tank system is subject to the requirements in 40 C.F.R. §§ 265.1052 through 265.1060. Nevertheless, the waste profile for the hazardous waste stored in the tank (Attachment 1) specifies the following chemical composition:

a.	Water	30 – 60%
b.	Isopropanol	5 – 10%
c.	Toluene	12% Maximum
d.	Xylene	12% Maximum
e.	N-Hexane	10% Maximum
f.	Acetone	5% Maximum
g.	Isobutanol	2% Maximum
h.	Methyl Ethyl Ketone	2% Maximum
i.	N-Butyl	1% Maximum
j.	Acetate	1% Maximum

Based on the waste profile, it is reasonable to expect that the concentration of organic compounds in Apollo's hazardous waste is greater than 10 percent by weight. Therefore, all equipment (i.e., pumps, compressors, pressure relief, devices sampling, connection systems, valves, open-ended valves or lines, flanges and other connectors) in contact with the waste is subject to the requirements in subpart BB, of 40 C.F.R. Part 265. According to the tank's piping and instrumentation diagram provided during the inspection (Attachment 2), the tank is equipped with an emergency valve and .5 psig check valves. Due to the lack of means to climb to the top of the tank, these devices were not observed during the inspection.

At the time of the inspection, none of the equipment (i.e., pumps, compressors, pressure relief, devices sampling, connection systems, valves, open-ended valves or lines, flanges and other connectors) that is associated with the operation of the tank and in contact with the hazardous waste was marked in a manner that could be distinguished from other pieces of equipment at the facility (Pictures 12 – 13).

Picture 12: View of pipelines near the hazardous waste tank (the western side of the tank is on the left side of the picture). Pipeline on the right side of the picture is used to transfer waste from the tank to the truck loading station.



Picture 13: T-connection and check valve in the hazardous waste pipeline associated with the hazardous waste storage tank.

Apparent Violation:

It appears that Apollo has failed to adhere to some of the conditions for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(a)(1)(ii), which incorporates subparts BB, and CC of 40 C.F.R. Part 265. At a minimum, it appears that Apollo failed to meet the following requirements:

a. ***Determine the total organic content of the hazardous managed in the tank system, as required in 40 C.F.R. § 265.1064(k).***

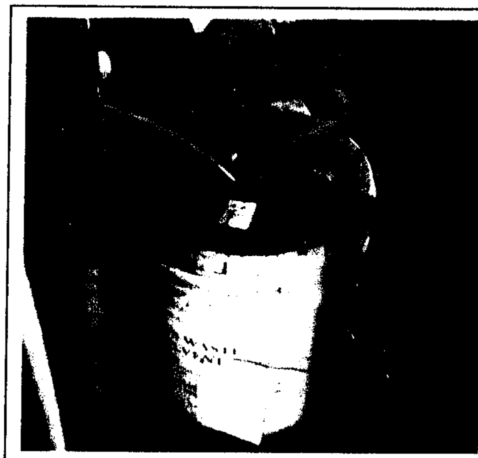
b. ***Clearly mark all equipment that is in contact with hazardous waste, starting at the consolidation container in the blending room through the hazardous waste loading station, as required in 40 C.F.R. § 265.1050(c).***

c. ***Determine the maximum organic vapor pressure of the waste in the tank, as required in 40 C.F.R. § 265.1085(c)(1).***

Therefore, Apollo appears to be in violation of RCRA § 3005.

Wastewater Oil/Water Separator Pretreatment Unit

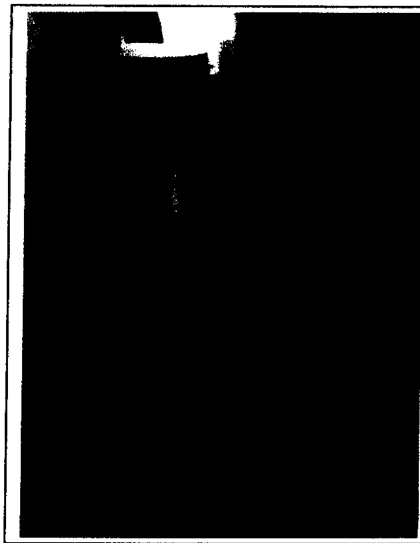
Apollo treats their process bath water prior to discharging it to the publicly owned sewer line. This pretreatment system generates an oily waste, which Apollo accumulates in five gallon container. Apollo manages the oily waste as characteristic hazardous waste D001/D035//F001/F002/F003 /F005). At the time of the inspection, the container was properly identified, closed and appeared to be in good condition (Picture 14).



Picture 14: SAA container for hazardous waste at the oil/water separator pretreatment unit.

Universal Waste Storage Area:

Across from the warehouse area, Apollo had two containers with universal waste lamps. The containers were closed and properly identified. However, the containers were not marked with the date accumulation started. No information was made available during the inspection that showed how long the lamps in the two boxes had been stored (Picture 15).



Picture 15: Universal waste lamps accumulation containers

Apparent Violation:

Apollo was not able to demonstrate the length of time that the universal waste lamps in the containers have been accumulating. Therefore, it appears that Apollo was in violation of 40 C.F.R. § 273.15(c).

Records Review

During the inspection, EPA and GAEPD representatives reviewed the following documents:

Training records
Manifests (September 2009 to December 2010)
Inspection records
Contingency plan

Apollo indicated during the inspection that they have an in-house RCRA training program in place. The training records provided were limited to the sign-up sheet. Apollo did not have the following training records:

a. The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;
b. A written job description for each hazardous waste management position; and,
c. A written description of the type and amount of both introductory and continuing training that will be given to each hazardous waste management position

According to Mr. Javeed Syed, the facility inspects, for the presence of leaks, the hazardous waste storage tank and the hazardous waste consolidation container every day. The form used to record the inspection only includes the date of the inspection and the signature of the person conducting the inspection. (See Attachment 3)

Apparent Violations:

Pursuant to 40 C.F.R. § 262.34(a)(1)(ii) a generator may accumulate hazardous waste in tanks for ninety day or less without a permit or interim status, provided the generator complies with all applicable requirements in subparts J, BB and CC of 40 C.F.R. Part 265. At a minimum, it appears that Apollo failed to meet the following requirements:

1. ***40 C.F.R. § 265.195(b), by failing to inspect all above ground portions of the tank system, to detect corrosion or releases of waste and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation)***

2. ***40 C.F.R. § 265.195(e), by failing to inspect the tank's cathodic protection system, at a minimum, within six months after initial installation and annually, thereafter.***

3. *40 C.F.R. § 265.195(g), by failing to document in the operating record of the facility the inspection of the items required to be inspected in 40 C.F.R. §§ 265.195(b) and (g).*

4. ***Clearly mark all tank's ancillary equipment that is in contact with hazardous waste, starting at the consolidation container in the blending room through the hazardous waste loading station, as required in 40 C.F.R. § 265.1050(c).***

5. ***C.F.R. § 265.1085(c)(1), by failing to include in the facility operating record all equipment that is subject to Subpart BB of 40 C.F.R. 265, the following information:***

    a. ***the equipment identification number and hazardous waste management unit identification number;***
    b. ***approximate location of the hazardous waste management unit within the facility;***
    c. ***type of equipment; percent-by-weight organics; and***
    d. ***hazardous waste state (i.e., gas or vapor); and methods of compliance.***

6. ***Determine the maximum organic vapor pressure of the waste in the tank, as required in 40 C.F.R. § 265.1085(c)(1).***

Therefore, Apollo appears to be in violation of RCRA § 3005.

Pursuant to 40 C.F.R. § 262.34(a)(4) a generator may accumulate hazardous waste in tanks for ninety day or less without a permit or interim status, provided the generator complies with all applicable requirements in subparts C and D of 40 C.F.R. Part 265.

At a minimum, it appears that Apollo was in violation of 40 C.F.R. § 265.16(d), by failing to keep in the facility records the following documents:

1. ***The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;***

2. ***A written job description for each hazardous waste management position;***

3. ***A written description of the type and amount of both introductory and continuing training that will be given to each person filling hazardous waste management position; and,***

4. ***Records that document that the training or job experience required under paragraphs (a), (b), and (c) above.***

Therefore, Apollo appears to be in violation of RCRA § 3005.

10) **Out-Briefing**

At the conclusion of the inspection, the inspector informed Apollo's representatives of the preliminary conclusions of the inspection.

11) **Conclusion/Areas of Concerns**

Based on the inspection findings it appears that Apollo was in violation of the following requirements:

a. Subpart BB of 40 C.F.R. 265- failure to implement a RCRA air emissions monitoring program;
b. 40 C.F.R. § 262.34(c)(1)(ii) –failure to mark hazardous containers;
c. 40 C.F.R. § 265.173(a) – open hazardous waste containers;
d. 40 C.F.R. § 273.15(c) – failure to document accumulation start date for universal waste lamps;
e. 40 C.F.R. § 265.195(b) – failure to inspect all above ground portions of the tank system, to detect corrosion or releases of waste and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation);
f. 40 C.F.R. § 265.195(e) – failure to inspect the tank's cathodic protection system;
g. 40 C.F.R. § 265.195(g) – incomplete inspection records: and,
h. 40 C.F.R. § 265.16(d) – incomplete training program.

12) **Signed**

Javier E. García, Inspector and
Author of Report

2/10/11
Date

13) **Concurrence/Approval**

Bill Truman, Acting Chief
South RCRA and OPA Enforcement and
Compliance Section
RCRA and OPA Enforcement and Compliance Branch

Date 2/10/11

Attachment 1

Hazardous Waste Chemical Profile

Apollo Technologies, Inc.
Smyrna, Georgia
EPA ID NUMBER: GAD 051 021 285

WASTE PROFILE

APOLLO INDUSTRIES, INC.
EPA ID NO. GAD051021285
1850 S.Cobb Industrial Blvd.
Smyrna, Georgia 30082
770-433-0210 Phone
678-241-0020 Fax
24 Hour Contact: Javeed Syed
Cell: 770-315-3562

WASTE DESCRIPTION:

Waste Common Name: Isopropanol & Water

Company Process Generating Waste: Spent Water / Solvent from manufacture of aerosol products.

Anticipated Volume: 5,000 – 10,000 gallons per month

GENERAL PROPERTIES:

Physical State: 100% liquid; < 1% Solid; 0% Sludge; 0% Gas.
Odor: Mild (Alcohol)
Color: Brown
Pumpable: Yes

PHYSICAL PROPERTIES:

Specific Gravity: 0.8 - 0.95 g/mL
Wt/Gal: 7.5 - 7.8 - 1 gal
Flash Point: 70°F - 140°F
P.H.: 7.1 - 12.0
BTU: 5,000 - 10,000
Chlorine: < 5% per 5,000 Gallon

CHEMICAL COMPOSITION:

Component:		
Water	30 - 60%	Acetone - 0 - 5%
Isopropanol	5 - 10%	n-Butyl 0 - 1%
Isobutanol	2% max	Acetate 0 - 1%
MEK	2% max	Toluene 0 - 12%
N-Hexane	10% max	Xylene 0 - 12%

REGULATORY INFORMATION:

RCRA Information:
D001
D035
F001
F002
F003
F005

DOT Information:
RQ Waste Flammable Liquid – N.O.S. (Isopropanol, Acetone)
Hazardous Class 3
I.D. Number UN.1993 PG III

Analytical Environmental Servs, Inc.

Date: 04-Feb-03

CLIENT:	Apollo Industries, Inc	Client Sample ID:	HAZ WASTE WATER SAMPL
Lab Order:	0301577	Tag Number:	
Project:		Collection Date:	1/23/03 8:00:00 AM
Lab ID:	0301577-001A	Matrix:	WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS		SW8260B				Analyst: NWH
1,1,1-Trichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1,2,2-Tetrachloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1,2-Trichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1-Dichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1-Dichloroethene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,2-Dichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,2-Dichloropropane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
2-Butanone	BRL	50		ppm	5000	1/29/03 10:20:00 PM
2-Hexanone	BRL	50		ppm	5000	1/29/03 10:20:00 PM
4-Methyl-2-pentanone	BRL	50		ppm	5000	1/29/03 10:20:00 PM
Acetone	9400	1000		ppm	50000	1/30/03 6:01:00 PM
Benzene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Bromodichloromethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Bromoform	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Bromomethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Carbon disulfide	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Carbon tetrachloride	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chlorobenzene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chloroform	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chloromethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
cis-1,2-Dichloroethene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
cis-1,3-Dichloropropene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Dibromochloromethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Ethylbenzene	560	25		ppm	5000	1/29/03 10:20:00 PM
m,p-Xylene	1800	50		ppm	5000	1/29/03 10:20:00 PM
Methylene chloride	280	25		ppm	5000	1/29/03 10:20:00 PM
o-Xylene	370	25		ppm	5000	1/29/03 10:20:00 PM
Styrene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Tetrachloroethene	2100	250		ppm	50000	1/30/03 6:01:00 PM
Toluene	750	25		ppm	5000	1/29/03 10:20:00 PM
trans-1,2-Dichloroethene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
trans-1,3-Dichloropropene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Trichloroethene	1500	250		ppm	50000	1/30/03 6:01:00 PM
Vinyl chloride	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Surr: 4-Bromofluorobenzene	109	71.8-143		%REC	5000	1/29/03 10:20:00 PM
Surr: 4-Bromofluorobenzene	105	71.8-143		%REC	50000	1/30/03 6:01:00 PM
Surr: Dibromofluoromethane	98.3	80.3-123		%REC	5000	1/29/03 10:20:00 PM
Surr: Dibromofluoromethane	89.9	80.3-123		%REC	50000	1/30/03 6:01:00 PM
Surr: Toluene-d8	109	70.1-142		%REC	5000	1/29/03 10:20:00 PM

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

Analytical Environmental Servs, Inc.

Date: *04-Feb-03*

CLIENT:	Apollo Industries, Inc.	**Client Sample ID:**	HAZ WASTE WATER SAMPL
Lab Order:	0301577	**Tag Number:**	
Project:		**Collection Date:**	1/23/03 8:00:00 AM
Lab ID:	0301577-001A	**Matrix:**	WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS		SW8260B				Analyst: NWH
Surr: Toluene-d8	90 8	70 1-142		%REC	50000	1/30/03 6:01.00 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
BRL	Below Reporting Limit	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
N	Analyte not NELAC certified	P	NELAC analyte certification pending
Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

15260 Parts Per million total organic (VOC)

$$\frac{15260}{10,000} = 1.526\%$$ Solution of organic VOC

25,000 lbs Total tank volume

$$\frac{1.526}{100} = .01526$$ #/# of VOC organic

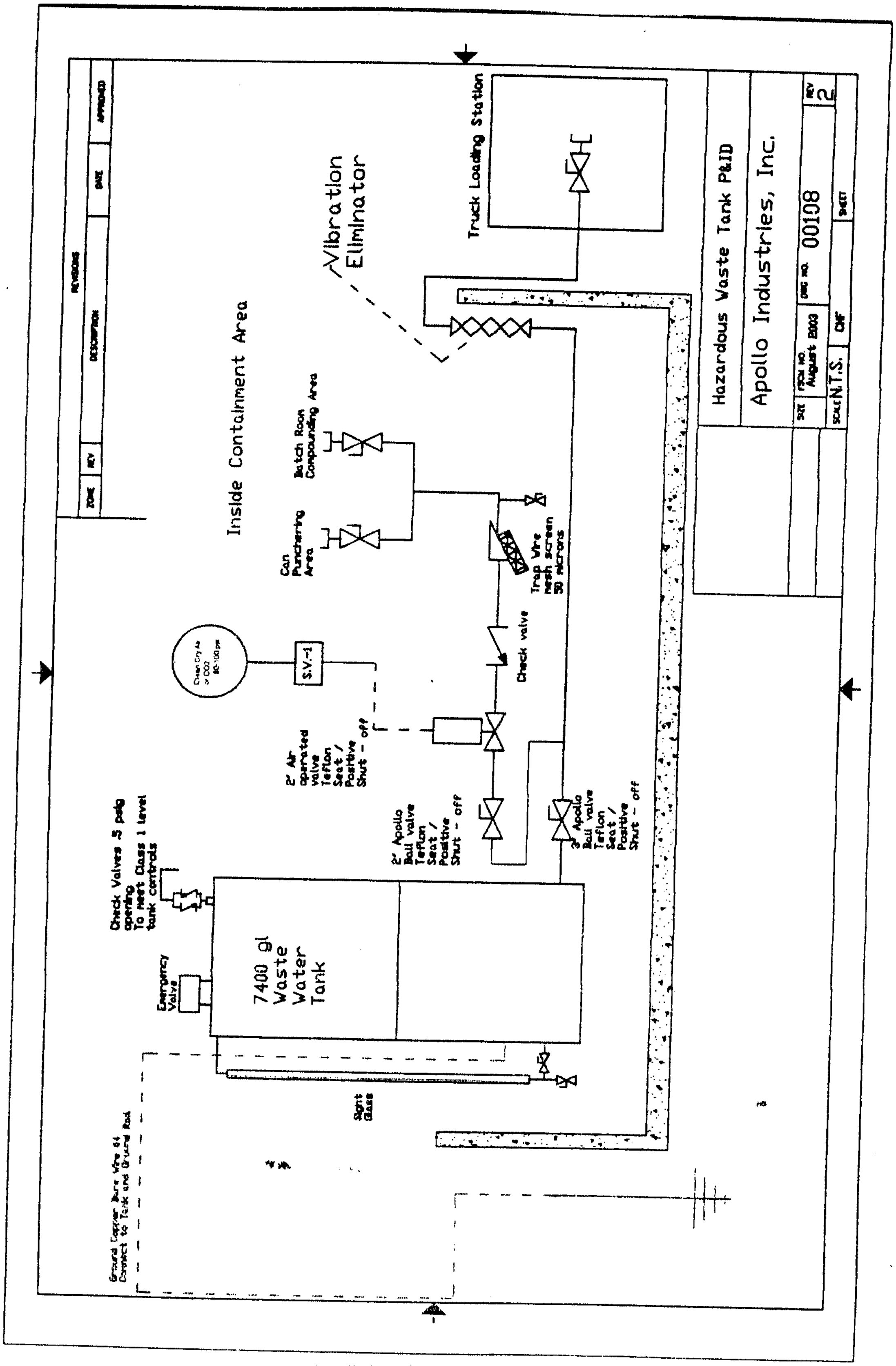
$.01526 \times 25000 = 381.5$ VOC

Attachment 2

Hazardous Waste Tank's Piping and Instrumentation Diagram
Apollo Technologies, Inc.
Smyrna, Georgia

EPA ID NUMBER: GAD 051 021 285

Tank PI&D


Hazardous Waste Tank P&ID
Apollo Industries, Inc.
00108
2
August 2003
N.T.S.
Truck Loading Station
Vibration Eliminator
Inside Containment Area
Batch Room Compounding Area
Can Punchering Area
Trap Wire mesh screen 50 microns
Check valve
S.V.-1
2" Air operated valve Teflon Seat / Positive Shut - off
2" Apollo Ball valve Teflon Seat / Positive Shut - off
3" Apollo Ball valve Teflon Seat / Positive Shut - off
Check Valves .5 psig opening To meet Class 1 level tank controls
Emergency Valve
7400 gl Waste Water Tank
Sight Glass
Ground Copper Bare Wire 4 Connect to Tank and Ground Rod

Attachment 3

Hazardous Waste Inspection Form
Apollo Technologies, Inc.
Smyrna, Georgia

EPA ID NUMBER: GAD 051 021 285

SOLID HAZWASTE INSPECTION LOG

Month/Yr: 2010

Date	Inspector	Date	Inspector
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	
		31	

The above signed certifies that an inspector has inspected the Solid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

____

____

Review: ______________________ Date: ______________________
Plant Manager

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apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

March 23, 2011

Mr. Bill Truman, Acting Chief
United States Environmental Protection Agency - Region 4
South Enforcement Section
RCRA and OPA Enforcement and Compliance Branch
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-8960

Subject: RCRA Compliance Evaluation Inspection
Apollo Technologies, Inc.
EPA ID Number GAD051021285

Dear Mr. Truman:

Apollo Technologies, Inc. (Apollo) is in receipt of your Compliance Evaluation Inspection (CEI) report dated February 10, 2011. Specifically, on December 13, 2010, the Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (GAEPD) conducted a Resource Conservation and Recovery Act (RCRA) Compliance Evaluation Inspection (CEI) at the Apollo Technologies, Inc., Smyrna, Georgia facility to determine the facility's compliance status with RCRA.

The February 10, 2011 CEI report served to provide the findings of the inspection, inclusive of alleged violations of RCRA discovered during the inspection. Apollo appreciates your report and the professionalism with which inspectors (both EPA and GAEPD) conducted the CEI. In anticipation of a possible Notice of Violation issued by your agency, Apollo has prepared this letter and supporting documents to clarify perceived discrepancies and address alleged RCRA violations as contained in the CEI report.

EPA comments are provided in italic type font, and responses thereto are provided in bold type font below:

<u>Date and Time of Inspection</u>
December 13, 2010
10:30 AM

Docket No. 769155

<u>Applicable Regulations</u>
Resource Conservation and Recovery Act (RCRA) Section 3002, 3004, 3005 and 3007, (42 US Code - Annotated U.S.C.A. §§ 6922, 6924, 6925 and 6927), 40 Code of Federal

Regulations (C.F.R.) Parts 260-266, 270, 273, 279, adopted and incorporated by reference in Chapter 391-3-11 of the Georgia Rules for Hazardous Waste Management (GRHWM).

Purpose of Inspection
This was an EPA oversight comprehensive evaluation inspection (CEI) to determine Apollo Technologies, Inc.'s (Apollo) compliance with all applicable State and Federal RCRA regulations.

Inspection Participants
Maria Theo-Callas, Apollo Technologies, Inc.
Ian Johnston, Apollo Technologies, Inc.
Javeed Syed, Apollo Technologies, Inc.
Amanda Howell, Georgia Environmental Protection Division (GAEPD)
Becky Ferguson, GAEPD
Araceli Bonilla, United States Environmental Protection Agency (US EPA)
Javier Garcia, US EPA

Response: It should be noted that William H. Lucas, III, P.G., of Peachtree Environmental, Inc. (Apollo's environmental engineering consultant) arrived at the Apollo facility approximately one (1) hour after the initiation of the inspection and was present throughout the remainder of the inspection timeframe.

Javeed Syed, Apollo's Environmental & Safety Manager, arrived at the Apollo facility approximately two (2) hours after the initiation of the inspection and was present throughout the remainder of the inspection timeframe. Mr. Syed was not available at the beginning of the facility inspection due to other Apollo business responsibilities.

Research and Development Laboratory/Quality Control Laboratory
The laboratories are contiguous and operated by the same personnel. In two fume ventilation hoods, Apollo tests aerosol cans by spraying product into cutoff 1-gallon metal containers. These containers were not labeled and were not kept closed (Pictures 1 - 2). Adjacent to the fume ventilation hoods, Apollo had one 5-gallon container for the consolidation of the waste collected in the 1-gallon containers. The 5-gallon container was labeled, but not closed (Pictures 3 - 4).

Apparent Violations:

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(ii). 40 C.F.R. § 262.34(c)(1)(ii) requires that a container holding hazardous waste must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. At the time of the inspection, Apollo had three hazardous waste accumulation containers that were not marked. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(i) which incorporates 40 C.F.R. § 265.173(a). 40 C.F.R. § 265.173(a) requires that a container holding hazardous waste must be always closed, except when adding or removing waste. At the time of the *inspection, Apollo had four hazardous waste accumulation containers that were open when no waste was being added to or removed from the containers. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.*

Response: Apollo has implemented appropriate measures regarding 40 CFR § 262.34(c)(1)(ii), which requires that a container holding hazardous waste must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. See attached Photo Log depicting hazardous waste satellite accumulation containers.

Apollo adheres to the requirements of 40 CFR § 262.34(c)(1)(i), which incorporates 40 CFR § 265.173(a) and requires that a container holding hazardous waste must be always closed, except when adding or removing waste. During operating hours, Apollo personnel are constantly adding waste to the observed container, which is why it was open at they time of the inspection.

<u>HP Analytical Laboratory</u>
In this laboratory, Apollo tests standards in a gas chromatograph (GC). The spent isopropyl alcohol generated from the operation of the GC unit is accumulated in a 4 liter glass bottle. At the time of the inspection, the SAA container was properly closed and labeled (Picture 5). As illustrated in Picture 5, the container was dated with the accumulation start date. The inspectors indicated to Ms. Callas that SAA containers are not required to be dated until the amount of hazardous waste in the SAA exceeds 55 gallons.

Response: Comment noted.

<u>Batch Room</u>
The Batch Room is in the western side of the manufacturing building. This room houses the aboveground tanks where the product ingredients are mixed. When needed, Apollo rinses the mixing tanks with isopropyl alcohol and collects the tanks' rinsate in small containers that are immediately emptied into a 20-gallon plastic container kept in the room (Picture 6). In addition to the rinsate from the blending tanks, Apollo uses the 20-gallon container as the collection point for all other hazardous waste generated at the facility. Therefore the container is subject to the requirement applicable to the 90-day storage areas. At the time of the inspection, the 20-gallon container was on a self-contained pallet. The container was properly labeled, closed and dated (12/10/10). Also in this room, Apollo had a partially full mop bucket with liquids spilled in the area. The container was not closed or labeled. Ms. Callas indicated that the liquid from the bucket is poured into the 20-gallon hazardous waste container.

Apollo representatives indicated that due to the variety of products produced at the facility, they manage all rinsates as hazardous wastes with the hazardous waste codes D001/D035//F001/F002/F003/F005. Facility personnel explained that once the *container is full, the operator connects a hose to the container and pumps the waste to the 7,400 gallon hazardous waste storage tank (Picture 7).*

Apparent Violations:

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(ii). 40 C.F.R. § 262.34(c)(1)(ii) requires that a container holding hazardous wastes must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. At the time of inspection the mop bucket observed in the Batch Room was not properly marked. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(i), which incorporates 40 C.F.R. § 265.173(a). 40 C.F.R.. § 265.173(a) requires that a container holding hazardous wastes must always be closed, except when adding or removing waste. At the time of the inspection, the mop bucket observed in the Batch Room was open when no waste was being added to or removed from the container. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

Response: Apollo does not recall indicating that the referenced mop bucket contained anything other than soapy water. In the absence of actual analytical testing data, Apollo maintains that it cannot be assumed that the mop bucket contained hazardous waste. While it was indicated that when the mop bucket is used to contain recovered spilled liquids that are subsequently transferred to the 20-gallon container, the nature of the liquids within the mop bucket was not confirmed at the time of the inspection.

Product Filling Lines

All four filling lines were observed during the inspections. Each line had a metal pad to collect drippings from the lines. In addition to the drip pans, Apollo was using 5-gallon open top containers to collect drippings from the filling tanks. As with the rinsates from the mixing tanks, Apollo manages all drippage generated at the filling stations as D001/D035/F001/F002/F003/F005 hazardous waste.

At the time of the inspection, none of the accumulation containers or drip pans were marked with the words "Hazardous Waste" or with a description of the wastes that were being accumulated in them (Pictures 8 - 11). (Note: Due to the fire suppression equipment in the area, no flash was used when taking the pictures. Therefore, the quality of some pictures was compromised.)

Apparent Violations:

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(ii) . 40 C.F.R. § 262.34(c)(1)(ii) requires that a container holding hazardous wastes must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. At *the time of inspection, Apollo had three 5-gallon containers and three drip containment pans that were not properly marked. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.*

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(c)(1)(i), which incorporates 40 C.F.R. § 265.173(a) . 40 C.F.R. § 265.173(a) requires that a container holding hazardous waste must be always closed, except when adding or removing waste. At the time of the inspection, Apollo had three hazardous waste accumulation containers that were open when no waste was being added to or removed from them. As such, Apollo was storing waste in apparent violation of RCRA Section 3005.

Response: Apollo has implemented appropriate measures regarding 40 CFR § 262.34(c)(1)(ii), which requires that a container holding hazardous waste must be marked either with the words "Hazardous Waste" or with other words that identify the contents of the containers. However, with respect to the drip pans which are part of the individual product filling lines and therefore not considered as individual containers, Apollo has been previously instructed by GAEPD personnel during prior inspections (2010 inspection) that labeling of such drip pans is not required. Furthermore, there is no means of covering such drip pans, otherwise their intended purpose (catch inadvertent spillage) would be rendered useless. These drip pans underneath various product filling lines are not intended as long-term accumulation containers but function much like secondary containment. Immediately following the completion of a product line, contents within the drip pans are physically removed and either transferred to a "reuse" container or into the 20-gallon satellite waste accumulation container.

More importantly, however, it should be noted that at the time of the inspection, the drip pans did not contain hazardous waste. These pans contained only water and sodium benzoate.

Apollo adheres to the requirements of 40 CFR § 262.34(c)(1)(i), which incorporates 40 CFR § 265.173(a) and requires that a container holding hazardous waste must be always closed, except when adding or removing waste. During actual product line operation, the lids on the 5-gallon containers are removed to allow drippage from the filling lines to be captured within the containers. Following the completion of a product line, lids are placed on the 5-gallon containers and the contents are then immediately transferred to either the reuse container or the 20-gallon satellite accumulation tank.

Hazardous Waste Storage Tank

The hazardous waste storage tank is outside the production building in the western side of the property. The tank has secondary containment. At the time of the inspection, the *tank was properly identified and dated. No evidence of releases was observed in the containment area.*

Apollo had not determined whether or not the waste managed in the tank system is subject to the requirements in 40 C.F.R. § 265.1052 through 265.1060. Nevertheless, the waste profile for the hazardous waste stored in the tank (Attachment 1) specifies the following chemical composition:

a.	*Water*	*30 - 60%*
b.	*Isopropanol*	*5 - 10%*
c.	*Toluene*	*12% Maximum*
d.	*Xylene*	*12% Maximum*
e.	*N-Hexane*	*10% Maximum*
f.	*Acetone*	*5% Maximum*
g.	*Isobutanol*	*2% Maximum*
h.	*Methyl Ethyl Ketone*	*2% Maximum*
i.	*N-Butyl*	*1% Maximum*
j.	*Acetate*	*1 % Maximum*

Based on the waste profile, it is reasonable to expect that the concentration of organic compounds in Apollo's hazardous waste is greater than 10 percent by weight. Therefore, all equipment (i.e., pumps, compressors, pressure relief, devices sampling, connection systems, valves, open-ended valves or lines, flanges and other connectors) in contact with the waste is subject to the requirements in subpart BB, of 40 C.F.R. § Part 265. According to the tank's piping and instrumentation diagram provided during the inspection, the tank is equipped with an emergency valve and .5 psig check valves. Due to the lack of means to climb to the top of the tank, these devices were not observed during the inspection.

At the time of the inspection, none of the equipment (i.e., pumps, compressors, pressure relief, devices sampling, connection systems, valves, open-ended valves or liens, flanges and other connectors) that is associated with the operation of the tank and in contact with the hazardous waste was marked in a manner that could be distinguished from other pieces of equipment at the facility (Pictures 12 - 13).

Apparent Violation:

It appears that Apollo has failed to adhere to some of the conditions for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(a)(1)(ii), which incorporates subparts BB, and CC of 40 C.F.R. Part 265. At a minimum, it appears that Apollo failed to meet the following requirements:

a. *Determine the total organic content of the hazardous managed in the tank system, as required in 40 C.F.R. § 265.1064(k).*

b. *Clearly mark all equipment that is in contact with hazardous waste, starting at the consolidation container in the blending room through the hazardous waste loading station, as required in 40 C.F.R. § 265.1050(c).*

c. *Determine the maximum organic vapor pressure of the waste in the tank, as required in 40 C.F.R. § 265.1085(c)(1).*

Therefore, Apollo appears to be in violation of RCRA § 3005.

Response: **Regarding Items a. and b. above, Apollo has determined the total organic content of the hazardous waste managed in the system as required in 40 CFR § 265.1064(k). At the time of the December 13, 2010 inspection, Apollo provided EPA/GAEPD with a waste profile (not dated, signed, nor completed by Apollo but completed by the disposal facility by "estimating" waste content), accompanying analytical testing data package from an accredited analytical testing laboratory dated February 4, 2003 (see above referenced Attachment 1), together with a copy of a hand written set of calculations regarding the total organic content of the waste within the hazardous waste storage tank.**

It appears that the undated waste profile did not utilize the February 4, 2003 analytical testing data in determining the chemical composition of the waste. Utilizing the analytical testing data (i.e., February 2003 data), the following chemical composition of the waste was determined:

Acetone => 9,400 ppm or 0.94%
Ethylbenzene => 560 ppm or 0.056%
Total Xylenes => 2,170 ppm or 0.217%
Methyl Ethyl Ketone => 280 ppm or 0.028%
Tetrachloroethene => 2,100 ppm or 0.21%
Toluene => 750 ppm or 0.075%
Trichloroethene => 1,500 ppm or 0.15%
Total Organic Content => 16,760 ppm or 1.676%

Water = Remaining Content => 983,240 ppm or 98.324%

In reviewing the Attachment 1 organic content hand written calculations, it was noted that the total organic content from the attached analytical February 4, 2003 testing data, 16,760 parts per million (ppm), did not match the hand calculated total organic content of 15,260 ppm.

Conversion of the 16,760 ppm total organic content from the February 4, 2003 analytical data to a percent (%) of organic content in solution yields 16,760/10,000 => 1.676 %.

Conversion of the % of organic content in solution to a weight (i.e., pounds) of organic content per weight of total solution yields 1.676/100 => 0.01676 pounds of total organics per pounds of total solution.

Finally, a conversion to total weight by volume of organics is derived using the hazardous waste storage tank volume (i.e., 7,500-gallon capacity tank x 8.34 pounds/gallon assuming water) yields 62,550 pounds total tank volume. Using the value of 0.01676 pounds of total organics per pounds of total solution x 62,500 pounds total tank volume yields a value of 1,048.34 pounds by weight of total organic content, which is equivalent to approximately 1.68% by weight total organic content.

Based on the above, and the fact that the waste determination has indicated that the total organic content by weight is less than 10%, Apollo contends that the referenced 40 CFR § 265 subpart BB is not applicable for the hazardous waste storage system and associated appurtenances.

Apollo will characterize the total organic content of the waste when required/requested by the disposal facility and as required by State and/or Federal law. Such work would be recorded in the operating record as part of ongoing activities to ensure that the hazardous waste storage system continues to be in compliance with applicable regulations.

Regarding Item c. above, Apollo will calculate/determine the maximum organic vapor pressure of the waste in the tank, as required in 40 CFR § 265.1085(c)(1) using the procedures specified in § 265.1084(c) to ensure that the existing tank system meets the requirements of § 265.1085(c)(1) - (c)(4) for Tank Level 1 controls. Upon the calculation/determination of the maximum organic vapor pressure of the waste in the tank, results will be forwarded to EPA as a separate submittal.

Wastewater Oil/Water Separator Pretreatment Unit

Apollo treats their process bath water prior to discharging it to the publicly owned sewer line. This pretreatment system generates an oily waste, which Apollo accumulates in five gallon containers. Apollo manages the oily waste as characteristic hazardous waste D001/D035//F001/F002/F003/F005). At the time of the inspection, the container was properly identified, closed and appeared to be in good condition (Picture 14).

Response: Comment noted.

Universal Waste Storage Area

Across from the warehouse area, Apollo had two containers with universal waste lamps. The containers were closed and properly identified. However, the containers were not marked with the date accumulation started. No information was made available during the inspection that showed how long the lamps in the two boxes had been stored (Picture 15).

Apparent Violation:

Apollo was not able to demonstrate the length of time that the universal waste lamps in the containers have been accumulating. Therefore, it appears that Apollo was in violation of 40 C.F.R. § 273.15(c).

Response: Apollo has ensured that accumulation start dates are clearly marked on all universal waste accumulation containers such that the length of time that the universal wastes have been accumulating can be demonstrated. See attached Photo Log depicting the Universal Waste Lamp containers with accumulation start dates.

Records Review

During the inspection, EPA and GAEPD representatives reviewed the following documents:

Training records
Manifests (September 2009 to December 2010)
Inspection records
Contingency plan

Apollo indicated during the inspection that they have an in-house RCRA training program in place. The training records provided were limited to the sign-up sheet. Apollo did not have the following training records:

a. *The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;*
b. *A written job description for each hazardous waste management position; and,*
c. *A written description of the type and amount of both introductory and continuing training that will be given to each hazardous waste management position*

According to Mr. Javeed Syed, the facility inspects, for the presence of leaks, the hazardous waste storage tank and the hazardous waste consolidation container every day. The form used to record the inspection only includes the date of the inspection and the signature of the person conducting the inspection.

Apparent Violations:

Pursuant to 40 C.F.R. § 262.34(a)(1)(ii) a generator may accumulate hazardous waste in tanks for ninety days or less without a permit or interim status, provided the generator complies with all applicable requirements in subparts J, BB and CC of 40 C.F.R. Part 265. At a minimum, it appears that Apollo failed to meet the following requirements:

1. *40 C.F.R. § 265.195(b), by failing to inspect all above ground portions of the tank system, to detect corrosion or releases of waste and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).*

Response: **In accordance with 40 CFR § 265.195(b), Apollo has updated its tank system inspection forms to include all above ground portions of the tank system to detect corrosion or releases of waste and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation). Should any deficiencies be identified, then appropriate repairs and/or maintenance activities will be implemented. Results of the tank system inspections will be placed in the operating record to demonstrate compliance with 40 CFR § 265.195(b). See attached updated daily tank inspection log sheet.**

2. *40 C.F.R. § 265.195(e), by failing to inspect the tank's cathodic protection system, at a minimum, within six months after initial installation and annually, thereafter.*

Response: **In accordance with 40 CFR § 265.195(e), Apollo has performed an inspection the tank system and has determined that no portions of the hazardous waste storage tank system requires cathodic protection (see attached information). Results of the cathodic protection determination will be placed in the operating record to demonstrate compliance with 40 CFR § 265.195(e).**

3. *40 C.F.R. § 265.195(g), by failing to document in the operating record of the facility the inspection of the items required to be inspected in 40 C.F.R. §§ 265.195(b) and (g).*

Response: **In accordance with 40 CFR § 265.195(g), Apollo will include the results of all tank system inspections in the operating record to demonstrate compliance with 40 CFR § 265.195(b) and (g).**

4. *Clearly mark all tank's ancillary equipment that is in contact with hazardous waste, starting at the consolidation container in the blending room though the hazardous waste loading station, as required in 40 C.F.R. § 265.1050(c).*

Response: **For reasons stated previously (i.e., less than 10% weight by volume total organic content), Apollo does not believe that 40 CFR § 265.1050(c) as contained in subpart BB is applicable.**

5. *C.F.R. § 265.1085(c)(1), by failing to include in the facility operating record all equipment that is subject to Subpart BB of 40 C.F.R. 265, the following information:*

   a. *the equipment identification number and hazardous waste management unit identification number;*
   b. *approximate location of the hazardous waste management unit within the facility;*
   c. *type of equipment; percent-by-weight organics; and*

d. *hazardous waste state (i.e., gas or vapor); and methods of compliance.*

Response: For reasons stated previously (i.e., less than 10% weight by volume total organic content), Apollo does not believe that Subpart BB of 40 CFR § 265 is applicable.

6. *Determine the maximum organic vapor pressure of the waste in the tank, as required in 40 C.F.R. § 265.1085(c)(1).*

Response: As stated previously, Apollo will calculate/determine the maximum organic vapor pressure of the waste in the tank, as required in 40 CFR § 265.1085(c)(1) using the procedures specified in § 265.1084(c) to ensure that the existing tank system meets the requirements of § 265.1085(c)(1) - (c)(4) for Tank Level 1 controls. Upon the calculation/determination of the maximum organic vapor pressure of the waste in the tank, results will be forwarded to EPA as a separate submittal.

Pursuant to 40 C.F.R. § 262.34(a)(4) a generator may accumulate hazardous waste in tanks for ninety days or less without a permit or interim status, provided the generator complies with all applicable requirements in subparts C and D of 40 C.F.R. Part 265.

At a minimum, it appears that Apollo was in violation of 40 C.F.R. § 265.16(d), by failing to keep in the facility records the following documents:

1. *The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;*

Response: Apollo has updated its employee listing inclusive of job titles for each position at the facility related to hazardous waste management and the name of each employee filling each position. Such information has been placed in the facility operating record for future reference and will be updated as necessary to reflect changes in personnel and/or responsibilities. A copy is also attached hereto.

2. *A written job description for each hazardous waste management position;*

Response: Apollo has updated its job descriptions for various positions at the facility as related to hazardous waste management. Such information has been placed in the facility operating record for future reference and will be updated as necessary to reflect changes in job description responsibilities. A copy is also attached.

3. *A written description of the type and amount of both introductory and continuing training that will be given to each person filling hazardous waste management position; and,*

Response: **Apollo has updated descriptions of both introductory and continuing training that has been and will be given to each person filling hazardous waste management positions. Such information has been placed in the facility operating record for future reference and will be updated as necessary to reflect changes in job description and/or required training responsibilities. A copy is also attached.**

4. *Records that document the training or job experience required under paragraphs (a), (b), and (c) above.*

Response: **Apollo has updated records to document the training or job experience required under paragraphs (a), (b), and (c) above. Such information has been placed in the facility operating record for future reference and will be updated as necessary to reflect changes in job description and/or required training responsibilities.**

Based on the inspection findings, EPA concluded that it appeared that Apollo was in violation of the following requirements:

a. *Subpart BB of 40 C.F.R. 265 - failure to implement a RCRA air emissions monitoring program;*
b. *40 C.F.R. § 262.34(c)(1)(ii) - failure to mark hazardous containers;*
c. *40 C.F.R. § 265.173(a) - open hazardous waste containers*
d. *40 C.F.R. § 273.15(c) - failure to document accumulation start date for universal waste lamps;*
e. *40 C.F.R. § 265.195(b) - failure to inspect all above ground portions of the tank system, to detect corrosion or releases of waste and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation);*
f. *40 C.F.R. § 265.195(e) - failure to inspect the tank's cathodic protection system;*
g. *40 C.F.R. § 265.195(g) - incomplete inspection records; and,*
h. *40 C.F.R. § 265.16(d) - incomplete training program.*

However, for the reasons stated herein, Apollo does not believe that it is in violation of most of the above cited regulations. Additionally, Apollo has undertaken certain activities to correct noted deficiencies where applicable.

In closing, Apollo appreciates your February 10, 2011 CEI report and hopes that you consider this response prior to taking any future actions. Please feel free to contact me at (770) 433-0210, Extension 1202 should you have any questions or concerns.

Sincerely yours,

APOLLO INDUSTRIES, INC.

Maria Callas

Maria-Theo Callas
President

attachments

cc: M. Mavridis, Apollo Industries
B. Gallo, Krevolin & Horst LLC
C. MacPherson, Peachtree Environmental, Inc.

ATTACHMENTS

PHOTO LOG

PHOTOGRAPH LOG

SITE: Apollo Industries Facility; Smyrna, Cobb County, Georgia Photo Log

No.	Direction	Description
1	NA	View of self-closing hazardous waste storage container in Research & Development/Quality Control Laboratory.
2	NA	View of satellite hazardous waste accumulation container with labeling.
3	NA	View of satellite hazardous waste accumulation container with labeling.
4	NA	View of satellite hazardous waste accumulation container with labeling.
5	NA	View of satellite hazardous waste accumulation container with labeling.
6	NA	View of satellite hazardous waste accumulation container with labeling.
7	NA	View of satellite hazardous waste accumulation container with labeling.
8	NA	View of satellite universal waste lamp accumulation container with labeling.
9	NA	View of satellite universal waste lamp accumulation container with labeling.
10	NA	View of satellite universal waste lamp accumulation container with labeling.

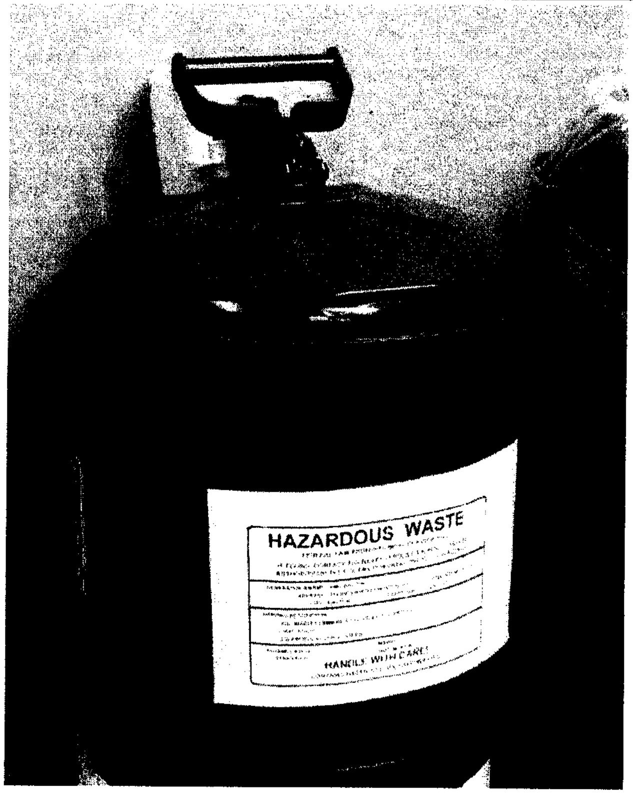

Photo 1 View of self-closing hazardous waste storage container in Research & Development/Quality Control Laboratory.

Photo 2 View of satellite hazardous waste accumulation container with labeling.

Photo 3 View of satellite hazardous waste accumulation container with labeling.

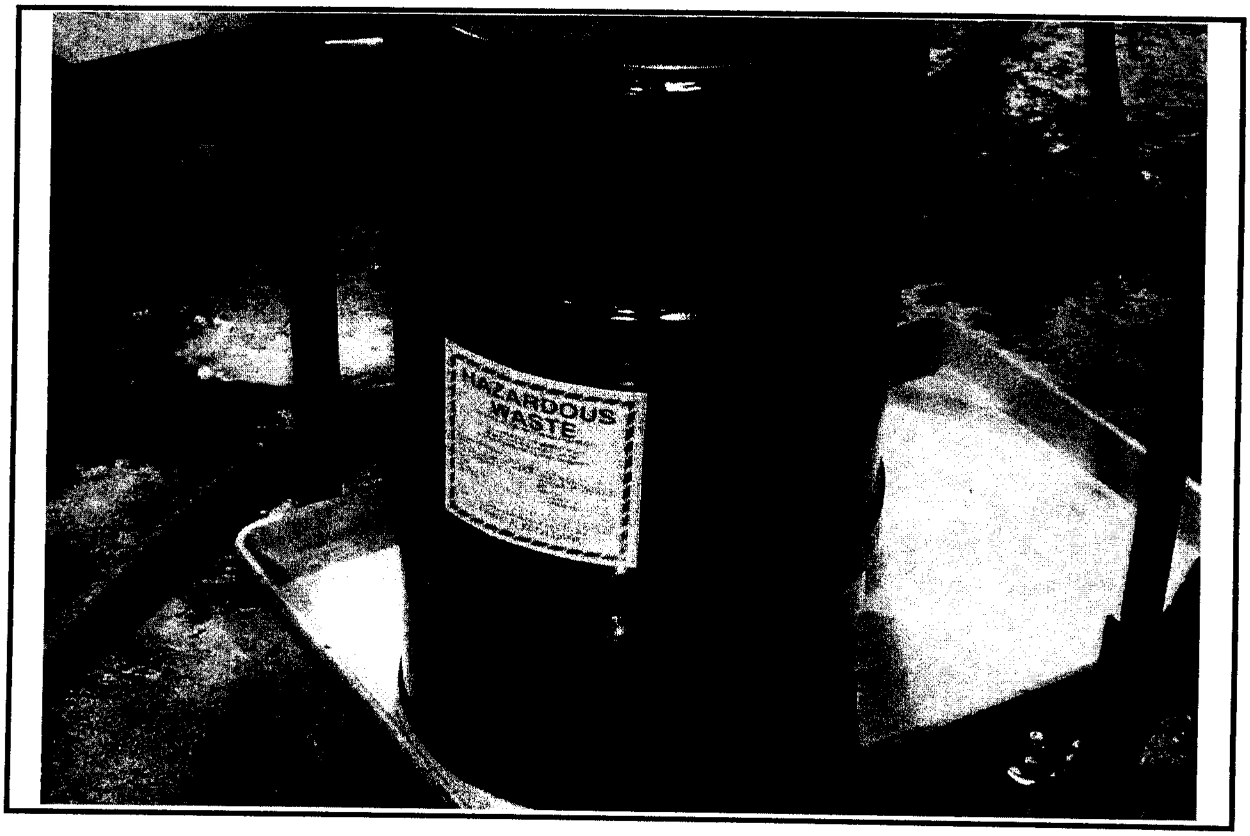

Photo 4 View of satellite hazardous waste accumulation container with labeling.

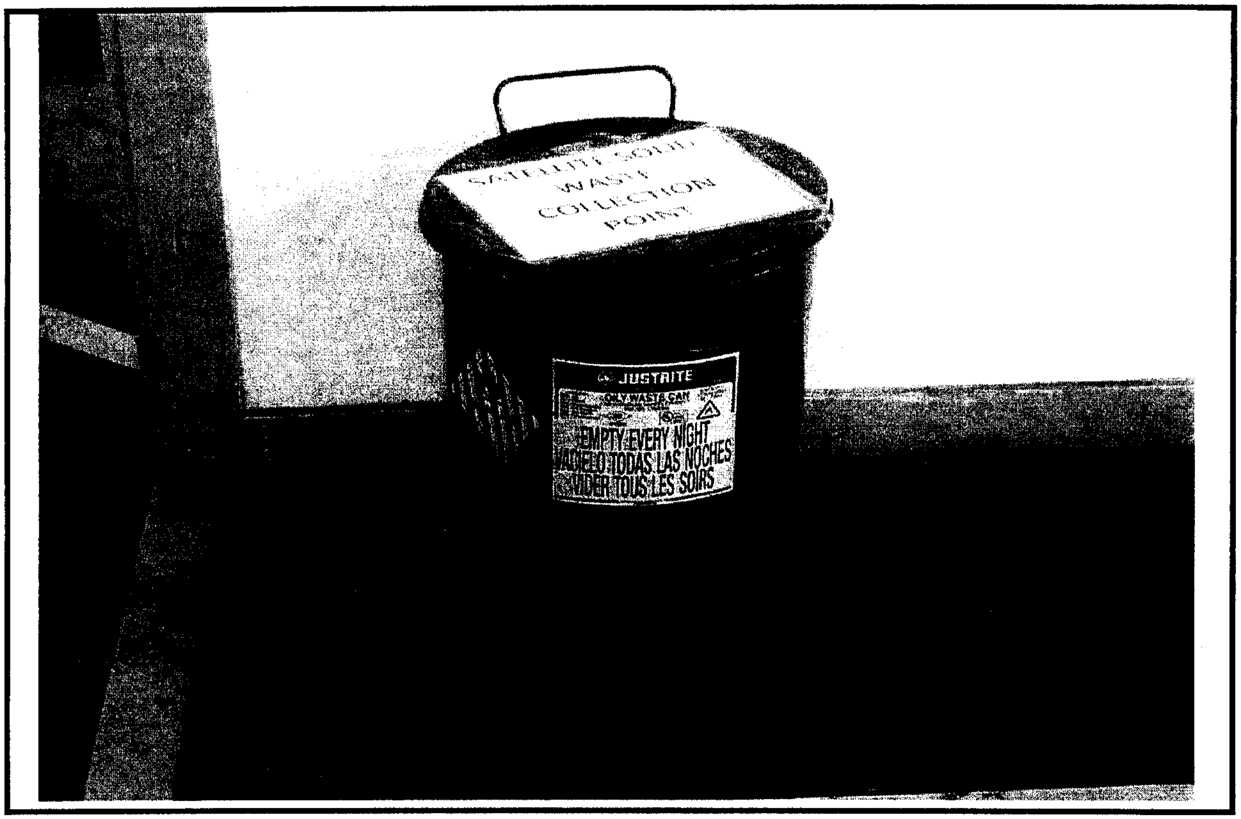

Photo 5 View of satellite universal waste lamp accumulation container with labeling.

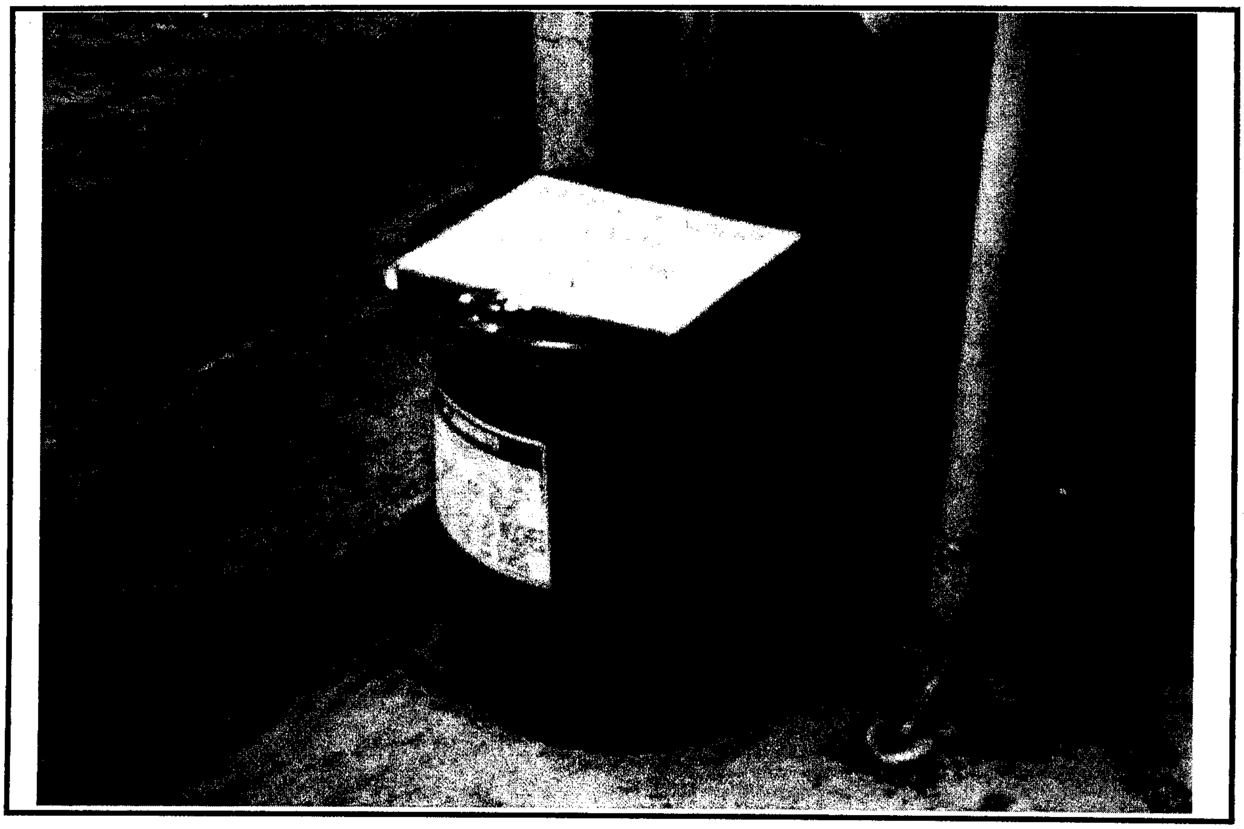

Photo 6 View of satellite universal waste lamp accumulation container with labeling.

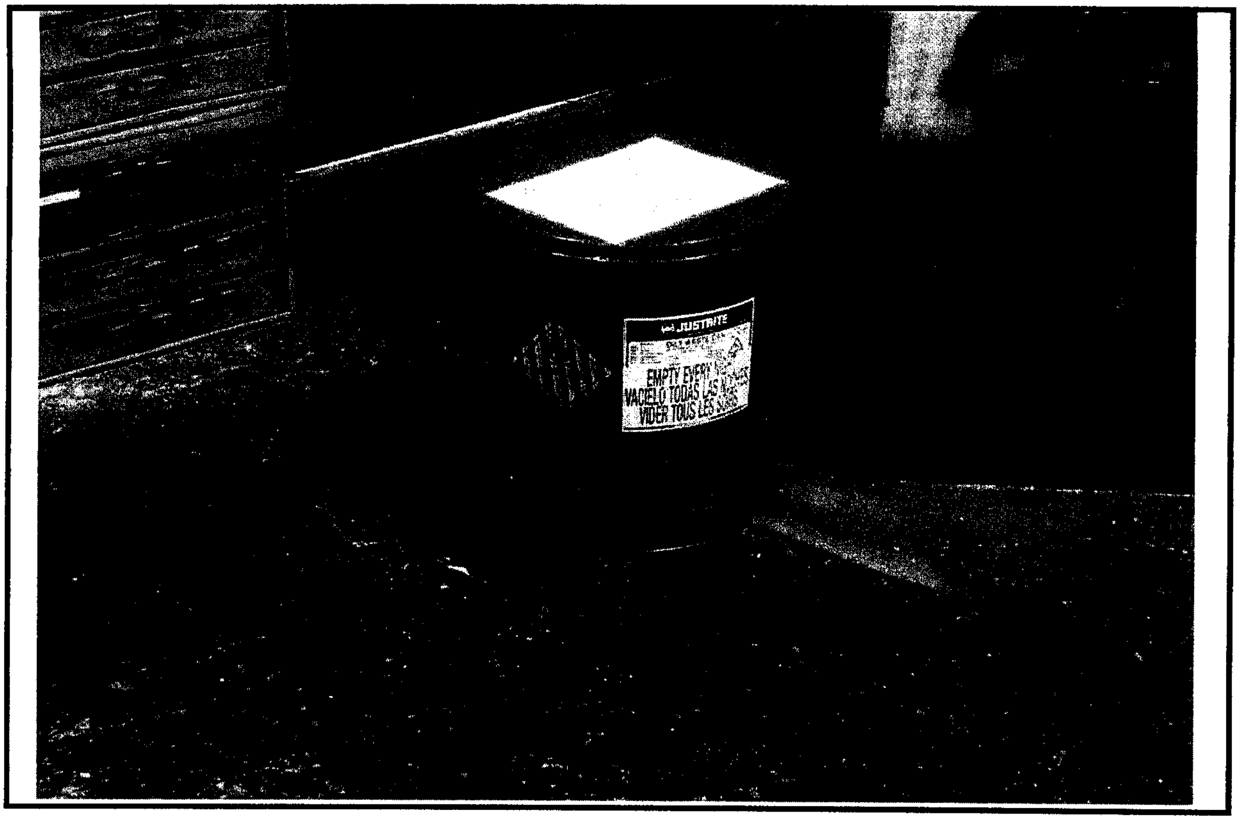

Photo 7 View of satellite hazardous waste accumulation container with labeling.

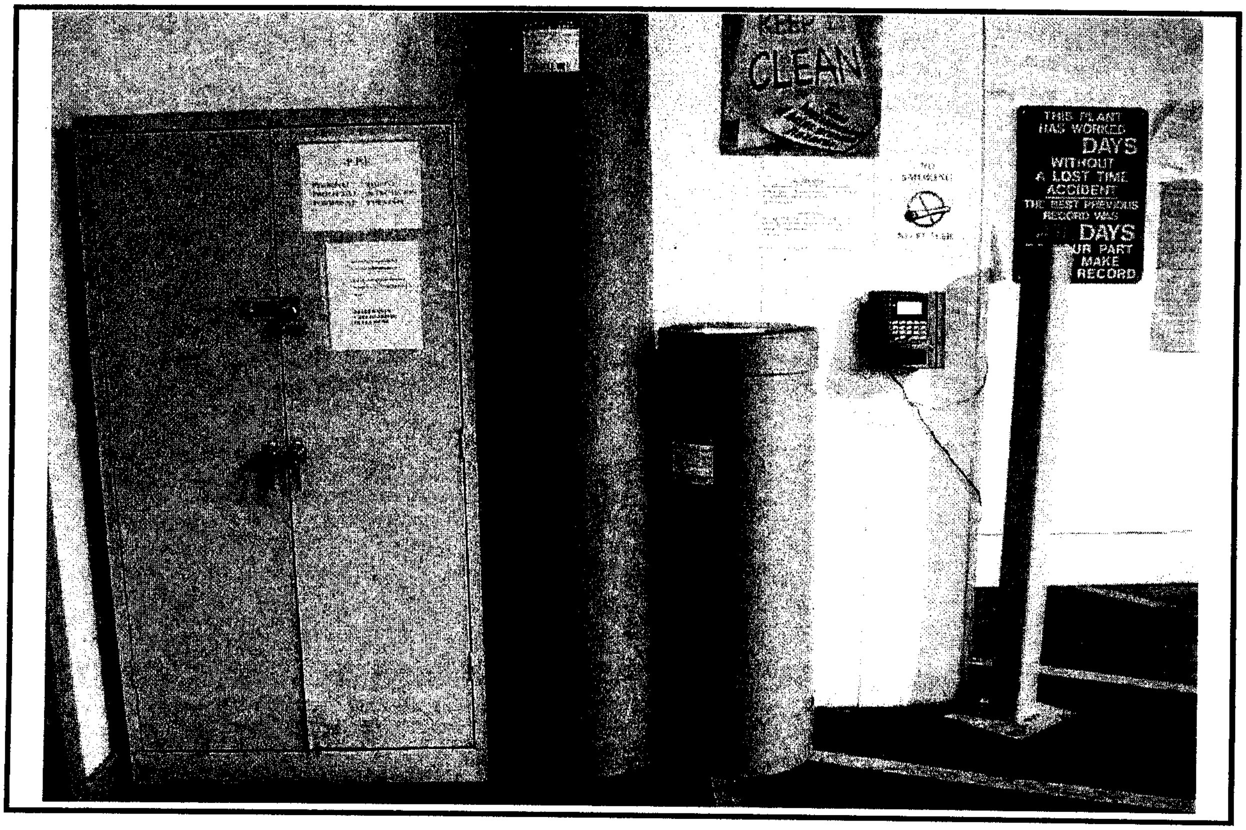

Photo 8 View of satellite universal waste lamp accumulation container with labeling.

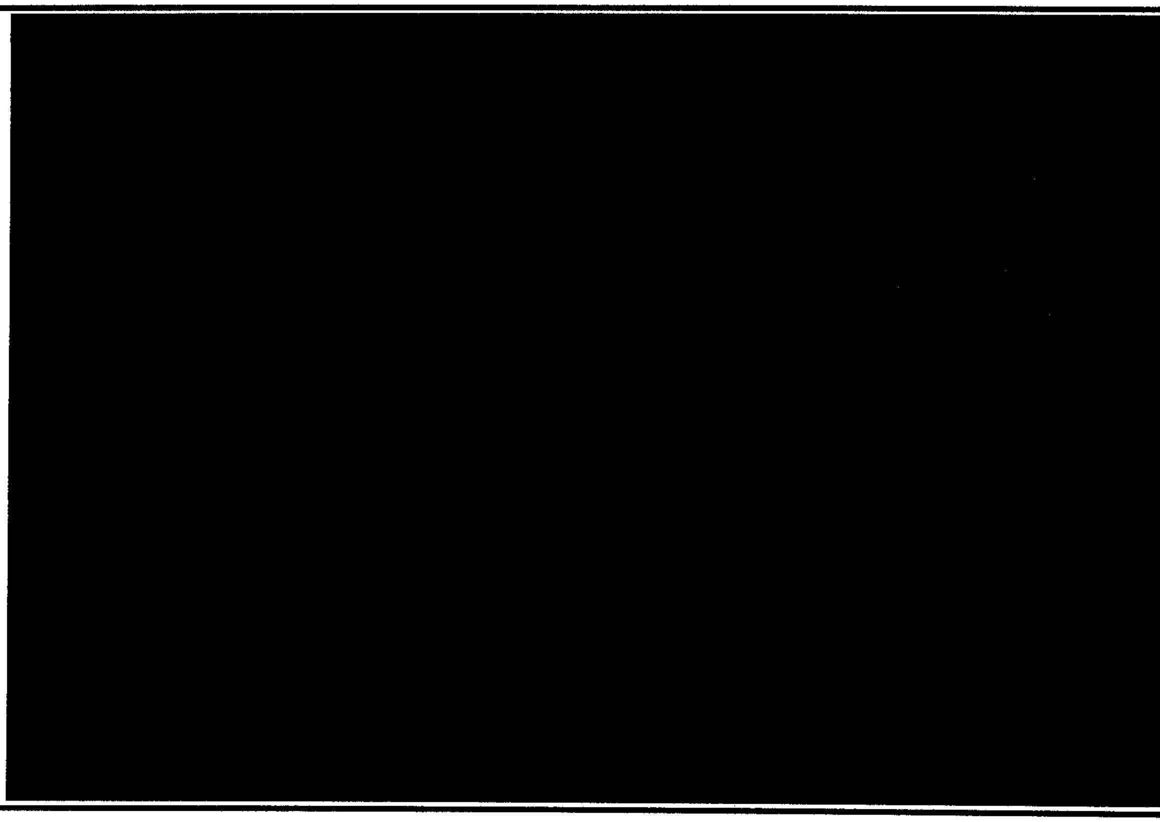

Photo 9 View of satellite universal waste lamp accumulation container with labeling.

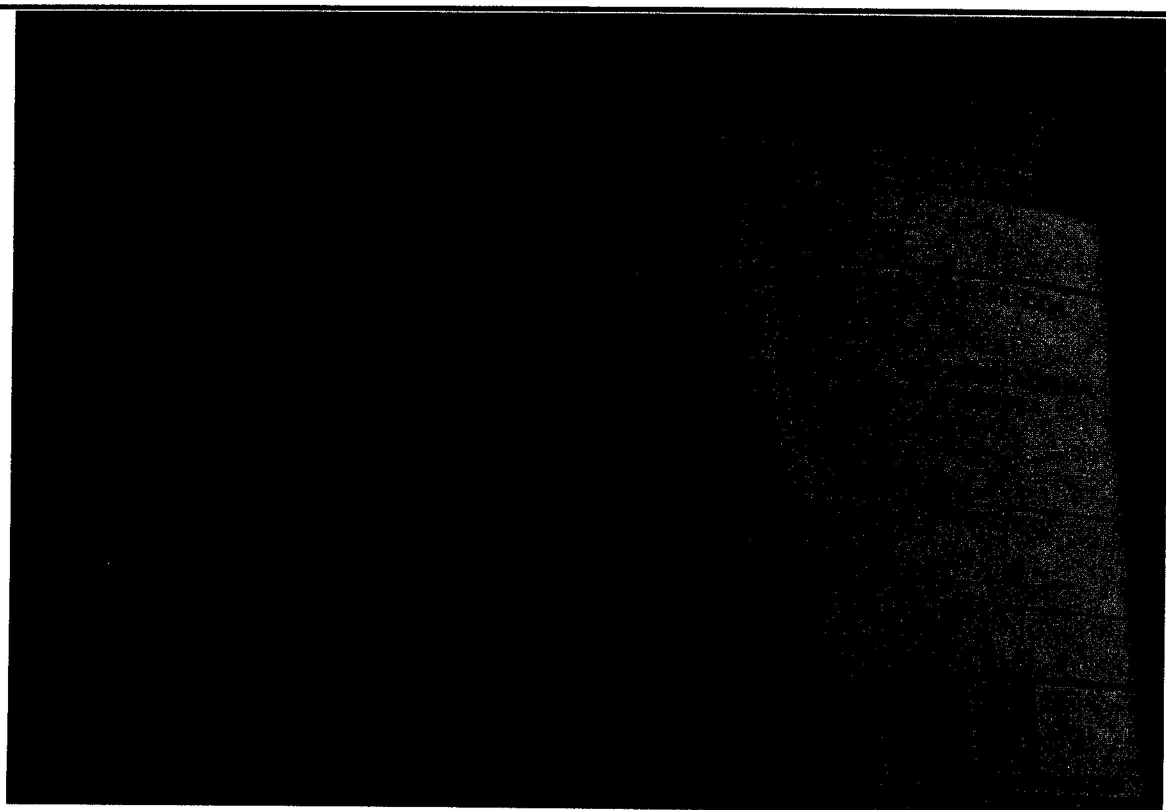

Photo 10 View of satellite universal waste lamp accumulation container with labeling.

FEBRUARY 2003 HAZARDOUS WASTE TANK ANALYTICAL TESTING DATA AND HAND WRITTEN TOTAL ORGANIC CONTENT CALCULATIONS

WASTE PROFILE

APOLLO INDUSTRIES, INC.
EPA ID NO. GAD051021285
1850 S.Cobb Industrial Blvd.
Smyrna, Georgia 30082
770-433-0210 Phone
678-241-0020 Fax
24 Hour Contact: Javeed Syed
Cell: 770-315-3562

WASTE DESCRIPTION:

Waste Common Name: Isopropanol & Water

Company Process Generating Waste: Spent Water / Solvent from manufacture of aerosol products.

Anticipated Volume: 5,000 – 10,000 gallons per month

GENERAL PROPERTIES:

Physical State: 100% liquid; < 1% Solid; 0% Sludge; 0% Gas.
Odor: Mild (Alcohol)
Color: Brown
Pumpable: Yes

PHYSICAL PROPERTIES:

Specific Gravity: 0.8 - 0.95 g/mL
Wt/Gal: 7.5 - 7.8 - 1 gal
Flash Point: 70°F - 140°F
P.H.: 7.1 - 12.0
BTU: 5,000 - 10,000
Chlorine: < 5% per 5,000 Gallon

CHEMICAL COMPOSITION:

Component:		
Water	30 - 60%	Acetone - 0 - 5%
Isopropanol	5 - 10%	n-Butyl 0 - 1%
Isobutanol	2% max	Acetate 0 - 1%
MEK	2% max	Toluene 0 - 12%
N-Hexane	10% max	Xylene 0 - 12%

REGULATORY INFORMATION:

RCRA Information:
D001
D035
F001
F002
F003
F005

DOT Information:
RQ Waste Flammable Liquid – N.O.S. (Isopropanol, Acetone)
Hazardous Class 3
I.D. Number UN 1993 PG III

Analytical Environmental Servs, Inc.

Date: 04-Feb-03

CLIENT:	Apollo Industries Inc	Client Sample ID:	HAZ WASTE WATER SAMPL
Lab Order:	0301577	Tag Number:	
Project:		Collection Date:	1/23/03 8:00:00 AM
Lab ID:	0301577-001A	Matrix:	WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS		SW8260B				Analyst: NWH
1,1,1-Trichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1,2,2-Tetrachloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1,2-Trichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1-Dichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,1-Dichloroethene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,2-Dichloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
1,2-Dichloropropane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
2-Butanone	BRL	50		ppm	5000	1/29/03 10:20:00 PM
2-Hexanone	BRL	50		ppm	5000	1/29/03 10:20:00 PM
4-Methyl-2-pentanone	BRL	50		ppm	5000	1/29/03 10:20:00 PM
Acetone	9400	1000		ppm	50000	1/30/03 6:01:00 PM
Benzene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Bromodichloromethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Bromoform	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Bromomethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Carbon disulfide	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Carbon tetrachloride	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chlorobenzene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chloroethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chloroform	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Chloromethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
cis-1,2-Dichloroethene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
cis-1,3-Dichloropropene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Dibromochloromethane	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Ethylbenzene	560	25		ppm	5000	1/29/03 10:20:00 PM
m,p-Xylene	1800	50		ppm	5000	1/29/03 10:20:00 PM
Methylene chloride	280	25		ppm	5000	1/29/03 10:20:00 PM
o-Xylene	370	25		ppm	5000	1/29/03 10:20:00 PM
Styrene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Tetrachloroethene	2100	250		ppm	50000	1/30/03 6:01:00 PM
Toluene	750	25		ppm	5000	1/29/03 10:20:00 PM
trans-1,2-Dichloroethene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
trans-1,3-Dichloropropene	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Trichloroethene	1500	250		ppm	50000	1/30/03 6:01:00 PM
Vinyl chloride	BRL	25		ppm	5000	1/29/03 10:20:00 PM
Surr: 4-Bromofluorobenzene	109	71.8-143		%REC	5000	1/29/03 10:20:00 PM
Surr: 4-Bromofluorobenzene	105	71.8-143		%REC	50000	1/30/03 6:01:00 PM
Surr: Dibromofluoromethane	98.3	80.3-123		%REC	5000	1/29/03 10:20:00 PM
Surr: Dibromofluoromethane	89.9	80.3-123		%REC	50000	1/30/03 6:01:00 PM
Surr: Toluene-d8	109	70.1-142		%REC	5000	1/29/03 10:20:00 PM

Qualifiers:			
*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
BRL	Below Reporting Limit	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
N	Analyte not NELAC certified	P	NELAC analyte certification pending
Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

Analytical Environmental Servs, Inc.

Date: 04-Feb-03

CLIENT:	Apollo Industries, Inc	Client Sample ID:	HAZ WASTE WATER SAMPL
Lab Order:	0301577	Tag Number:	
Project:		Collection Date:	1/23/03 8:00:00 AM
Lab ID:	0301577-001A	Matrix:	WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS		SW8260B				Analyst: NWH
Surr: Toluene-d8	90.6	70.1-142		%REC	50000	1/30/03 6:01:00 PM

Qualifiers:				
*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
BRL	Below Reporting Limit	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
N	Analyte not NELAC certified	P	NELAC analyte certification pending
Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

15260 Parts Per million total organic (VOC)

$\frac{15260}{10,000}$ = 1.526% Solution of organic VOC

25,000 lbs Total tank Volume

$\frac{1.526}{100}$ = .01526 #/# of voc organic

.01526 x 25000 = 381.5 VOC

HAZARDOUS WASTE TANK SYSTEM CATHODIC PROTECTION INSPECTION / DETERMINATION

APOLLO
TECHNOLOGIES
"Quality Is Our Brand"

HAZARDOUS WASTE SYSTEM INSPECTION

As of this date, 3/17/2011, we have reviewed all components of the hazardous waste management system and no portion of this system requires cathodic protection.

Mike Mavridis
VP Apollo Technologies

APOLLO TECHNOLOGIES
1850 South Cobb Industrial Boulevard
Smyrna, Georgia 30082
Phone: 770-433-0210
Fax: 770-433-0132

UPDATED HAZARDOUS WASTE TANK SYSTEM DAILY INSPECTION FORM

HAZARDOUS WASTE TANK SYSTEM DAILY INSPECTION LOG
(AS REQUIRED BY 40 CFR 265.195)

BUSINESS NAME: APOLLO INDUSTRIES
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEORGIA

MONTH: MARCH
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	√		√		√		√		√		√		JAVEED SYED	
2	√		√		√		√		√		√		JAVEED SYED	
3	√		√		√		√		√		√		JAVEED SYED	
4	√		√		√		√		√		√		JAVEED SYED	
5														
6														
7	√		√		√		√		√		√		JAVEED SYED	
8	√		√		√		√		√		√		JAVEED SYED	
9	√		√		√		√		√		√		JAVEED SYED	
10	√		√		√		√		√		√		JAVEED SYED	
11	√		√		√		√		√		√		JAVEED SYED	
12														
13														
14	√		√		√		√		√		√		JAVEED SYED	
15	√		√		√		√		√		√		JAVEED SYED	
16	√		√		√		√		√		√		JAVEED SYED	
17	√		√		√		√		√		√		JAVEED SYED	
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NOTES:

1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon storage tank, and visual observation for signs of releases such as wet spots, dead vegetation.

APOLLO JOB DESCRIPTIONS, TRAINING INFORMATION/REQUIREMENTS, AND DOCUMENTATION

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Hazardous Waste Training

Areas/Jobs requiring training:

Machine Operators
Mechanics
Lab Personnel
Compounding Personnel

All personnel are required to be trained to handle hazardous materials through the "Right to Know" training program. There are additional requirements for those employees that label, handle and ship Hazardous Waste. These employees will be trained to understand Federal, State, local and company requirements for handling, labeling and shipping hazardous waste.

Each employee is instructed to handle chemicals safely and carefully. Any material that is deemed to be unfit for converting into a saleable item is gathered and deemed "waste." Each employee is instructed how and where to deposit this liquid waste material – to a closed 20-gal drum stored in the compounding room. Additionally, compounding personnel are trained to keep inspection and transfer logs to document accumulation and storage of hazardous waste.

All Hazardous Waste containers are to be properly marked. All Hazardous Waste containers are to be closed except when transferring material. When the 20-gal drum is full, a dedicated pump will be used to transfer the material to the 7500-gal Hazardous Waste tank. All connections and containers will be inspected to ensure no leaks are detected.

Solid Hazardous Waste is maintained in self-closing containers specifically for Solid Waste. All other labeling, inspection and documentation will be required for solid waste handling.

Javeed Syed

APOLLO TECHNOLOGIES
1850 South Cobb Industrial Boulevard
Smyrna, Georgia 30082
Phone: 770-433-0210
Fax: 770-433-0132

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

HAZARDOUS WASTE TRAINING OVERVIEW

During the training session, the attendees are instructed, to the following:

1) **Definition of Waste, Solid Waste and Hazardous Waste.**
2) **Reactivity of solid wastes**
3) **Toxic Wastes**
4) **How is hazardous waste being generated**
5) **Waste compatibility (with container)**
6) **Container marking**
7) **Container handling**
8) **Hazardous waste system management, inspection and maintenance**
9) **Contingency Plan (Emergency procedures, Evacuation Plan, etc)**
10) **Protective clothing (Gloves, goggles, etc)**

APOLLO TECHNOLOGIES
1850 South Cobb Industrial Boulevard
Smyrna, Georgia 30082
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Fax: 770-433-0132

Chapter 3

Chemical Safety

Introduction

The objective of this chapter is to provide guidance to all Apollo Industries, Inc. employees and participating guests who use hazardous materials so that they may perform their work safely. Many of these materials are specifically explosive, corrosive, flammable, or toxic; they may have properties that combine these hazards. Many chemicals are relatively non-hazardous by themselves but become dangerous when they interact with other substances, either in planned experiments or by accidental contact.

To avoid injury and/or property damage, persons who handle chemicals in any area of the Company must understand the hazardous properties of the chemicals with which they will be working. Before using a specific chemical, safe handling methods must always be reviewed. Supervisors are responsible for ensuring that the equipment needed to work safely with chemicals is provided. The cost of this equipment is borne by the Company.

Hazard Communication Plan

On May 25, 1986 the Occupational Safety and Health Administration (OSHA) placed in effect the requirements of a new standard called Hazard Communication (29 CFR 1910.1200). This standard establishes requirements to ensure that chemical hazards in the workplace are identified and that this information, along with information on protective measures, is transmitted to all affected employees.

This section describes how Apollo Industries, Inc. employees are informed of the potential chemical hazards in their work area so they can avoid harmful exposures and safeguard their health. Components of this program include labeling, preparing a material safety data sheet (MSDS), and training.

With regard to MSDS, Apollo Industries, Inc. has limited coverage under the OSHA Hazard Communication Standard. The Company is required to maintain only those sheets that are received with incoming shipments for the following reasons: the Company commonly uses small quantities of many different hazardous materials for short periods of time; that the hazards change, often unpredictably; many materials are of unknown composition and most workers are highly trained.

Responsibilities of Supervisors/Management

Identify hazards for respective work areas.

Ensure hazards are properly labeled.

Obtain/maintain copies of material safety data sheets, as required, of each hazardous material used in the work area and make them accessible to employees during each work shift.

Have the written Hazard Communication Program available to all employees.

Provide hazard-specific training for employees.

Identify hazardous materials in the hazard review section of the Apollo Industries. Inc. purchase requisition form.

Employees must:

Attend safety training meetings.

Perform operations in safe manner.

Notify management immediately of any safety hazards or injuries.

When ordering materials, identify hazardous chemicals in the hazard review section of the Apollo Industries, Inc. purchase requisition form.

The Responsible Safety Officer must:

Develop a written Hazard Communication Program.

Maintain a central file of material safety data sheets.

Review and update Apollo Industries, Inc. stock safety labels.

Provide generic training programs.

Assist supervisors in developing hazard-specific training programs.

Oversee the Hazard Communication Standard written policy and implementation plans.

Alert on-site contractors to hazardous materials in work areas.

Alert on-site contractors that they must provide to their employees information on hazardous materials they bring to the work site.

The number of hazardous chemicals and the number of reactions between them is so large that prior knowledge of all potential hazards cannot be assumed. Therefore, when the chemical properties of a material are not fully known, it should be assumed hazardous and used in as small quantities as possible to minimize exposure and thus reduce the magnitude of unexpected events.

The following general safety precautions should be observed when working with chemicals:

Keep the work area clean and orderly.

Use the necessary safety equipment.

Carefully label every container with the identity of its contents and appropriate hazard warnings.

Store incompatible chemicals in separate areas.

Substitute less toxic materials whenever possible.

Limit the volume of volatile or flammable material to the minimum needed for short operation periods.

Provide means of containing the material if equipment or containers should break or spill their contents.

Follow the requirements of this manual, if systems that can generate pressure or are operated under pressure are involved.

Provide a back-up method of shutting off power to a heat source if any hazard is involved.

Obtain and read the Material Safety Data Sheets.

Supervisor Responsibility

Supervisors are responsible for establishing safe procedures and for ensuring that the protective equipment needed to work with the chemicals is available. Supervisors must instruct their workers about possible hazards, safety precautions that must be observed, possible consequences of an accident, and procedures to follow if an accident does occur. The supervisor is required to enforce the proper use of protective equipment and the established safety practices.

It is the responsibility of employees and all who use Apollo Industries, Inc. facilities to understand the properties of the chemicals with which they will work and to follow all precautions that apply to each specific task.

When faced with an unexpected threat of malfunction, injury, or damage, employees are expected to choose a course of action that provides the most protection to themselves and to others in the area. Every employee is expected to report to the supervisor any unsafe condition seen in the area that would not permit him/her to work safely.

The Responsible Safety Officer assists employees and supervisors to work safely by providing information on the hazardous properties of materials, recommending methods for controlling the hazards of specific operations, and by monitoring the work environment.

Supervisors must instruct their personnel about the potential hazards involved in the work, proper safety precautions to follow, and emergency procedures to use if an accident should occur. To supplement the supervisor's training, the Responsible Safety Officer will conduct training courses and materials on selected topics. In addition, material safety data sheets and safety information, including hazards, health effects, potential routes of exposure, proper handling precautions, and emergency procedures on specific chemicals, are available through the Responsible Safety Officer's office.

Effects on Reproduction

Both men and women may be exposed to hazardous agents that can cause infertility or result in genetic damage that is passed on to offspring. These agents include ionizing radiation, alcohol, cigarette smoke, pharmaceuticals, and some of the thousands of different chemicals that are used in the home or workplace. Although many of these have been tested to determine whether they cause acute (immediate) effects on the body, few have been studied to see if they cause cancer (carcinogens), birth defects (teratogens), or genetic defects (mutagens). Even fewer have been studied to see if they can cause infertility, menstrual disorders, or other disorders relating to reproduction.

The primary path for hazardous substances to reach an unborn child is through the placenta. Scientists now believe that most chemical substances or drugs can cross this barrier with varying degrees of ease and enter the system of the developing fetus. Thus, many chemicals and drugs that enter a pregnant woman's body (through breathing, swallowing, absorption through the skin, etc.) will eventually enter the mother's blood circulation and find their way into the unborn child.

In general, the important questions of exactly how much of the toxic substance that enters the mother's body will reach the fetus or what concentration the fetus can tolerate without harmful effects are not yet answered.

The fetus may be most vulnerable in the early weeks of pregnancy, but it is also at risk later in pregnancy. In light of the potential harm of workplace exposures to both a pregnant woman and her developing fetus, it is very important and required by Apollo Industries, Inc. policy for the woman to inform the Responsible Safety Officer of her pregnancy immediately.

Chemical Storage

The separation of chemicals (solids or liquids) during storage is necessary to reduce the possibility of unwanted chemical reactions caused by accidental mixing. Explosives such as picric acid should be stored separately outdoors. Use either distance or barriers (e.g., trays) to isolate chemicals into the following groups:

Flammable liquids (e.g., acetone, benzene, ethers, alcohols). Place in approved fire lockers.

Other liquids (e.g., chloroform, trichloroethane).

Acids (e.g., nitric, sulfuric, hydrochloric, perchloric). * Treat acetic acid as a flammable liquid.

Bases (e.g., sodium hydroxide, ammonium hydroxide).

Lips, strips, or bars should be installed across the width of reagent shelves to restrain the chemicals in case of earthquake.

Chemicals must not be stored in the same refrigerator used for food storage. Refrigerators used for storing chemicals must be appropriately identified by placing a label on the door (labels may be obtained from Responsible Safety Officer).

Emergencies

In case of an emergency, consider any of the following actions if appropriate:

Evacuate people from the area.

Isolate the area.

If the material is flammable, turn off ignition and heat sources.

Call the Fire Department or 911 for assistance.

Wear appropriate personal protective equipment.

Pour Sorb-all or appropriate neutralizing agent on spill.

Clean up; place waste in plastic bag for disposal.

Chemical spill cleanup materials are available from stores as listed below:

Flammable solvent spill kit

Flammable solvent absorbent

Acid spill kit

Acid spill absorbent

Caustic (base) spill kit

Caustic (base) absorbent

Safety equipment kit (contains scoops, sponge, safety glasses, disposal bags, etc.)

Cabinet to hold kits

Disposal of Chemicals

All Apollo Industries, Inc. employees, participating guests, and visitors using hazardous chemicals are responsible for disposing of these chemicals safely. Federal and state regulations mandate strict disposal procedures for chemicals. To comply with these regulations all persons using Company facilities must observe these procedures.

Routine Disposal of Chemicals

In general the disposal of hazardous chemicals to the sanitary sewer is not permitted. The Responsible Safety Officer will advise on the proper disposal of chemical wastes. In using chemical waste storage containers, certain procedures must be observed, as listed below:

Incompatible chemicals must not be mixed in the same container (e.g., acids should not be mixed with bases; organic liquids should not be mixed with strong oxidizing agents).

Waste oils must be collected in 55-gallon drums. Disposal solids, and explosive materials must be stored in separate containers.

The following requirements must be met as a condition for pickup and disposal of chemicals by the Responsible Safety Officer:

Chemicals must be separated into compatible groups. Leaking containers of any sort will not be accepted.

Dry materials (gloves, wipes, pipettes, etc.) must be securely contained in plastic bags and over packed in a cardboard box. Packages that are wet or have sharp protruding objects will not be accepted for pick up.

Unknown chemicals will require special handling. The responsible department must make every effort to identify the material that is to be disposed. If all the user's attempts to identify the waste chemicals have failed, the Responsible Safety Officer will accept the waste and analyze the material. For more information call the Responsible Safety Officer.

Each breakable container must be properly boxed. Place all bottles in plastic bags, then place in a sturdy container and use an absorbent cushioning material that is compatible with the chemicals.

Each primary container must be labeled with content, amount, physical state, and the percentage breakdown of a mixture.

Each box must have a complete list of contents or description written on an official Responsible Safety Officer hazardous materials packing list. Blank packing lists are available from the Responsible Safety Officer.

For safety purposes, boxes must be of a size and weight so that one person can handle them. Boxes that exceed 45 pounds or 18 inches on a side cannot be safely handled by one person and will not be acceptable for pick up.

General Housekeeping Rules:

Maintain the smallest possible inventory of chemicals to meet your immediate needs.

Periodically review your stock of chemicals on hand.

Ensure that storage areas, or equipment containing large quantities of chemicals, are secure from accidental spills.

Rinse emptied bottles that contain acids or inflammable solvents before disposal.

Recycle unused laboratory chemicals wherever possible.

DO NOT:

Place hazardous chemicals in salvage or garbage receptacles.

Pour chemicals onto the ground.

Dispose of chemicals through the storm drain system.

Dispose of highly toxic, malodorous, or lachrymatory chemicals down sinks or sewer drains.

Certificate

This is to certify that
Javeed Syed
Apollo Technologies

has successfully completed

RCRA and DOT
Annual Update and Refresher

in accordance with 40 CFR 265.16 and has been trained and tested in General Awareness, Function-Specific, Safety, and Hazmat Security in accordance with the requirements of the US Department of Transportation at 49 CFR 172.702 and 49 CFR 172.704

presented by

Environmental Resource Center
101 Center Pointe Drive, Cary, NC 27513 919-469-1585
www.ercweb.com

Barry Gillespie		November 9, 2010
Barry Gillespie, Instructor	Employer	Certificate Number: 112455

DATE: 12/03/2010 **TRAINER: Javeed Syed**

HAZARD COMMUNICATION & RIGHT TO KNOW/HAZARDOUS WASTE TRAINING			
NAME	**JOB TITLE**	**TYPE OF TRAINING**	**INVOLVEMENT**
Peter Dunn	Compounding Mgr	Right to know&Hazardous Waste	Inspection of Waste System and supervision of handling of waste.
Jose Garcia	Compounder	Right to know&Hazardous Waste	Handling of Sattelite Accumul. Containers/Pumping into the Waste Tank
Noe Herra Lazano	Compounder	Right to know&Hazardous Waste	Handling of Sattelite Accumul. Containers/Pumping into the Waste Tank
jose' Sorroza	Gas room operator	Right to know&Hazardous Waste	Handling of Sattelite Accumul. Containers
Ceasar Galarza	Gas room operator	Right to know&Hazardous Waste	Handling of Sattelite Accumul. Containers
Rick Cleveland	Maint. Mechanic	Right to know&Hazardous Waste	Since they set up the fillers, they handle the line flush out, which becomes waste.
Barry Smith	Maint. Mechanic	Right to know&Hazardous Waste	Since they set up the fillers, they handle the line flush out, which becomes waste.
Randy Cottingham	Maint. Mechanic	Right to know&Hazardous Waste	Since they set up the fillers, they handle the line flush out, which becomes waste.
Michael Batte	Maint. Mechanic	Right to know&Hazardous Waste	Since they set up the fillers, they handle the line flush out, which becomes waste.
Steve Moore	Technical Director	Right to know&Hazardous Waste	If necessary, will test a flush out and will determine if it is waste or can be internally recycled.
Habbeba Querishi	Q.C. Mgr	Right to know&Hazardous Waste	If needed will bring samples to the lab for testing.
Judi Seams	Q.C. Technician	Right to know&Hazardous Waste	If needed will bring samples to the lab for testing.
Michael Gray	Chemist	Right to know&Hazardous Waste	If necessary, will test a flush out and will determine if it is waste or can be internally recycled.
Oscar Silva	Chemist	Right to know&Hazardous Waste	If necessary, will test a flush out and will determine if it is waste or can be internally recycled.
Kevin May	Chemist	Right to know&Hazardous Waste	If necessary, will test a flush out and will determine if it is waste or can be internally recycled.

DATE: 12/03/2010 **TRAINER: Javeed Syed**

HAZARD COMMUNICATION & RIGHT TO KNOW/HAZARDOUS WASTE TRAINING			
NAME	**JOB TITLE**	**TYPE OF TRAINING**	**SIGNATURE**
Peter Dunn	Compounding Mgr	Right to know&Hazardous Waste	Peter Dunn
Jose Garcia	Compounder	Right to know&Hazardous Waste	Jose Garcia
Noe Herra Lazano	Compounder	Right to know&Hazardous Waste	NOE Herrera. l
jose' Sorroza	Gas room operator	Right to know&Hazardous Waste	JOSE SORROZA
Ceasar Galarza	Gas room operator	Right to know&Hazardous Waste	CESAR GALARZA
Rick Cleveland	Maint. Mechanic	Right to know&Hazardous Waste	Rick Cleveland
Barry Smith	Maint. Mechanic	Right to know&Hazardous Waste	Barry Smith
Randy Cottingham	Maint. Mechanic	Right to know&Hazardous Waste	Randall Cottingham
Michael Batte	Maint. Mechanic	Right to know&Hazardous Waste	Michael Batte
Steve Moore	Technical Director	Right to know&Hazardous Waste	[illegible]
Habbeba Querishi	Q.C. Mgr	Right to know&Hazardous Waste	Habeeba Quereshi
~~Miriam Unger~~	~~Q.C. Technician~~	~~Right to know&Hazardous Waste~~	
Judi Seams	Q.C. Technician	Right to know&Hazardous Waste	Judy Seams
Michael Gray	Chemist	Right to know&Hazardous Waste	[illegible]
Oscar Silva	Chemist	Right to know&Hazardous Waste	Oscar Silva
Kevin May	Chemist	Right to know&Hazardous Waste	Kevin May

Annual 2010 TRAINING

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

12-3-2010

DATE: Jan-4th-2010

	ATTENDEES	JOB TITLE	SIGN-IN
1	Clint [illegible]	liquid line supervisor	[signature]
2	HABEEBA QUERISHI	QC manager	Habeeba Querishi 12-03-10
3	Mariela Calderon	QC	Mariela Calderon 8-5-10
4	~~America~~ Lizeth Martinez	QC	Lizeth Martinez 8/5/10
5	Michael Gray	Chemist	Mike Gray 8/5/10
6	RANDALL COTTINGHAM	MAINTENANCE	[signature] 12/3/10
7	Robby Ward	Ship/Rec.	Robby Ward 12/3/10
8	Sammy Scott	Analytical Chemist	[signature] 12-3-10
9	Bob McCollum	Technical	[signature] 12-03-2010
10	STEVE MOORE	TECHNICAL Director	[signature] 12/3/10
11	Oscar Silva	R&D Chemist	O. Silva 12/03/10
12	PETER DUNN	PLANT MGR	Peter Dunn 12.3.10
13	Onoria RIVERA	LINE SUPERVISOR	[signature] 12/3/10
14	Carlos Conde	PRODUCTION Mgr	[signature] 12/3/10
15	NOE Herrera.	Compounding	NOE HERRERA. 12-3-10
16	JOSE Garcia	Compounding	JOSE Garcia 12-3-10

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12/6/10

	ATTENDEES	JOB TITLE	SIGN-IN
1	Briano Robleva	PRODUCTION	[illegible]
2	Veronica Obando	"	Veronica Obando.
3	Aura milian	"	Aura milian
4	Graciela fernandez	"	Graciela fernandez
5	Pedro Ramirez	"	[illegible]
6	Jackeline M Henriquez	"	Jackeline M Henriquez
7	Rosa Guzman	"	Rosa Guzman
8	Tania Cruz	"	Tania Cruz
9	Ana Castillo	"	Ana Castillo
10	Carmen Hernández S	"	Carmen Hdez S
11	Gonzalez Sandra	"	Sandra Gonzalez
12	Felimon vasquez	"	vasquez Somoza
13	JAVIER DELGADO	"	[illegible]
14	NrColas q	"	[illegible]
15	Blanca Dominguez	"	Blanca Dominguez
16	Liz Olivera	"	[illegible]

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12/6/10

	ATTENDEES	JOB TITLE	SIGN-IN
1	Andres Vasquez	Production	Andres Vasquez
2	Manuel Delgado	"	Manuel Delgado
3	Jenifer Cabrera	"	Jenifer Cabrera.
4	Herminio Almaraz	"	Herminio
5	Ruben [illegible]	"	[illegible]
6	Pedro Rubio	"	[illegible]
7	Mauricio Field.	"	[illegible]
8	Cesar Carpio R.	"	[illegible]
9	Erk Guzman O.	"	[illegible]
10	Victor Aceves	"	[illegible]
11	Juana Maria Silva	"	Juana Maria Silva
12	Gregoria Villa	"	[illegible]
13			
14			
15			
16			

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-03-10

	ATTENDEES	JOB TITLE	SIGN-IN
1	Antonio Vasque Ruiz	Shipping / REC Forklift	Antonio Ruiz 12/3/10
2	Barry Smith	Main/man	Barry Smith 12/3/10
3	Cesar Galaeza	Gas House	Cesar Galaeza
4	Joel lopez	[illegible]	Joel Lopez
5	José Vasquez	Gas House	[illegible]
6	DENIS RUBIO	FILLER OP.	DENIS RUBIO
7	[illegible] Gallardo	QC	[illegible] Gallardo
8	Judy Sims	QC	Judy Sims
9	Pedro Rubio	FILLER OPERATOR	PR
10	Ruben LOPEZ	FILLER OPERATOR	[illegible]
11	Antonio Vasque Ruiz	Forklift Operator	Antonio Ruiz
12	PAUL M Wiley	~~SHIPPING RECEIVING~~	[illegible]
13	Santos Isabel Rubio	Shipping	[illegible]
14	LEE MARTIN	Shipping mgr.	Lee Martin
15	Samuel Garcia	Label Dept	[illegible]
16	MICHAEL BATTLE	MAINTANCE	Micheal Battle

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAR 2 1 2012

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Maria Theo-Callas, Chief Executive Officer
Apollo Technologies, Inc.
1850 S. Cobb Industrial Blvd.
Smyrna, Georgia 30082

SUBJ: RCRA Compliance Evaluation Inspection
Apollo Technologies, Inc.
EPA ID Number GAD 051 021 285

Dear Ms. Theo-Callas:

On July 26, 2011, the Environmental Protection Agency (EPA) conducted a Resource Conservation and Recovery Act (RCRA) Compliance Evaluation Inspection (CEI) at the Apollo Technologies, Inc. Smyrna, Georgia, to determine the facility's compliance status with RCRA.

Enclosed is the EPA RCRA CEI report, which indicates that possible violations of RCRA were discovered during the inspection. If you have any questions regarding the report, please contact Javier García, of my staff, by phone at (404) 562-8616 or by e-mail at garcia.javier@epa.gov.

Sincerely,

Larry L. Lamberth , Chief
South Enforcement Section
RCRA and OPA Enforcement and Compliance Branch

Enclosure

cc: Mr. John Fonk, GAEPD

Docket No. 769152

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAR 2 1 2012

Mr. Mark Smith, Chief
Hazardous Waste Management Branch
Environmental Protection Division
Georgia Department of Natural Resources
Two Martin Luther King, Jr. Drive
Suite 1154 East
Atlanta, Georgia 30334

SUBJ: RCRA Compliance Evaluation Inspection
Apollo Technologies, Inc.
EPA ID Number GAD 051 021 285

Dear Mr. Smith:

On July 26, 2011, the Environmental Protection Agency (EPA) conducted a Resource Conservation and Recovery Act (RCRA) Compliance Evaluation Inspection (CEI) at the Apollo Technologies, Inc. Smyrna, Georgia, to determine the facility's compliance status with RCRA.

Enclosed is the EPA RCRA CEI report, which indicates that violations of RCRA were discovered. If you have any questions regarding the inspection, please contact Javier García, of my staff, by phone at (404) 562-8616 or by e-mail at garcia.javier@epa.gov.

Sincerely,

Larry L. Lamberth, Chief
South Enforcement and Compliance Section
RCRA and OPA Enforcement and Compliance Branch

Enclosure

RCRA Inspection Report

1) Inspector and Author of Report

Javier E. García
Environmental Engineer

2) Facility Information

Apollo Technologies, Inc.
1850 S. Cobb Industrial Blvd.
Smyrna, Georgia

EPA ID NUMBER: GAD 051 021 285
NAICS Code: 325998 - All Other Miscellaneous Chemical Product and Preparation Manufacturing

3) Responsible Official

Maria Theo-Callas, Chief Executive Officer
(770) 433-0210

4) Inspection Participants

Maria Theo-Callas, Apollo Technologies, Inc.
Ian Johnston, Apollo Technologies, Inc.
Mike Mavridis, Apollo Technologies, Inc.
Javier Garcia, US EPA

5) Date and Time of Inspection

July 26, 2011
9:30 AM

6) Applicable Regulations

Resource Conservation and Recovery Act (RCRA) Sections 3002, 3004, 3005 and 3007, the Georgia Hazardous Waste Management Act (GHWMA), Ga. Code Ann. § 12-8-60 et. seq. (42 US Code – Annotated U.S.C.A. §§ 6922, 6924, 6925 and 6927), 40 Code of Federal Regulations (C.F.R.) Parts 260-266, 270, 273, 279, adopted and incorporated by reference in Chapter 391-3-11 of the Georgia Rules for Hazardous Waste Management (GRHWM)

7) Purpose of Inspection

This inspection was a follow up to the comprehensive evaluation inspection (CEI) conducted by the United States Environmental Protection Agency and the Georgia Environmental Protection Division (GAEPD) on December 13, 2010.

8) Facility Description

Apollo Technologies, Inc. (Apollo) operates out of a facility located in the South Cobb Industrial Park, in an area classified by Cobb County as "Heavy Industrial." The property covers about 2.2 acres and includes one manufacturing building and an office building. The facility is connected to the public water supplying system and sewage collection system.

Apollo manufactures, by contract, several organic and water based solvent cleaners, pesticides and janitorial aerosol products for different companies. All products are made in batches, based on clients needs. The product's ingredients are mixed in aboveground blending tanks and transferred to one of four filling stations. From the filling stations, the aerosol cans are tested, labeled and packaged for distribution. The facility has approximately 60 employees and operates one shift, five days a week.

Apollo is registered as a large quantity hazardous waste generator. All hazardous wastes generated at the facility are stored in a 7,500-gallon aboveground steel tank. The hazardous wastes generated at the facility consist of filling lines drippings, off-spec products that cannot be reformulated and blending tanks rinsate. The hazardous waste is collected in 20-gallon containers that when full are transferred to the blending room. Once in the blending room, the contents of the containers are pumped to the 7,500-gallon storage tank. Apollo classifies this waste stream as D001/D035//F001/F002/F003/F005 hazardous waste.

9) Previous Inspection Summary

On December 13, 2010, GAEPD and the EPA inspected the facility. Based on the inspection findings it appears that Apollo was in violation of the following requirements [as adopted and incorporated by reference in GRHWM § 391-3-11(1)]:

a. ***Subpart BB of 40 C.F.R. 265 - failure to implement a RCRA air emissions monitoring program;***
b. ***40 C.F.R. § 262.34(c)(1)(ii) – failure to mark hazardous containers;***
c. ***40 C.F.R. § 265.173(a) - open hazardous waste containers;***
d. ***40 C.F.R. § 273.15(c) - failure to document accumulation start date for universal waste lamps;***
e. ***40 C.F.R. § 265.195(b) - failure to inspect all above ground portions of the tank system, to detect corrosion or releases of waste and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation);***
f. ***40 C.F.R. § 265.195(e) - failure to inspect the tank's cathodic protection system;***
g. ***40 C.F.R. § 265.195(g) - incomplete inspection records: and,***
h. ***40 C.F.R. § 265.16(d) - incomplete training program.***

10) Findings

After introductions and presentation of credentials, the inspector informed Apollo's representatives that the inspection was a follow up to the December 2010 EPA and GAEPD inspection. After a brief description of the activities conducted at Apollo, the inspection team toured the facility. The following are the observations made during the inspection:

Universal Waste Storage Area:

Adjacent to break room, Apollo had two containers with universal waste lamps. The containers were closed properly identified and dated. (See picture 1)

Product Filling Lines

All four filling lines were observed during the inspections. Hazardous wastes generated in this area (i.e., dripping and filling operations residues) are accumulated in 30-gallon containers. Each line has its own 30-gallon container. At the time of the inspection, the containers were labeled, closed and appeared to be in good condition. Apollo should consider replacing the four 30-gallon containers (120 gallons total volume capacity), with either two 30-gallon containers or one 55-gallon container. This would allow Apollo to easily demonstrate compliance with the 55-gallon threshold limit for satellite accumulation areas as required in 40 C.F.R. § 262.34(c)(2). (See picture 2)

Batch Mixing Room

The Batch Mixing Room is in the western side of the manufacturing building. In this room, Apollo had a 30-gallon container that they use to pump all hazardous waste generated at the facility to their hazardous waste storage tank. This container is also used to collect the hazardous waste generated from the cleanup of the product mixing tanks. At the time of the inspection, the container was labeled and appeared to be in good condition. However, its bunghole was open at a time when no waste was being added or removed from it. (See picture 3)

Apparent Violations:

It appears that Apollo has failed to adhere to a condition for exemption from RCRA Section 3005 [GHWMA§ 12-8-60(a)] given in 40 C.F.R. § 262.34(c)(1)(i), which incorporates 40 C.F.R. § 265.173(a). 40 C.F.R. § 265.173(a) requires that a container holding hazardous waste must be always closed, except when adding or removing waste. At the time of the inspection, the pumping station hazardous waste container was open at a time when no waste was being added to or remove from the container. As such, Apollo was storing waste in apparent violation of RCRA Section 3005 [GHWMA§ 12-8-60(a)].

Hazardous Waste Storage Tank:

The hazardous waste storage tank is outside the production building in the western side of the property. It receives all hazardous wastes generated at the facility via the pump station container kept in the Batch Mixing Room. The tank has secondary containment. However, no secondary containment was provided to sections of the hazardous waste pipeline that had threaded flanges, valves, fittings and connectors. (See pictures 4 – 8)

In the report for the December 2010 inspection (December 2010 CEI), the EPA alleged that Apollo had failed to comply with the requirements in 40 C.F.R. §§ 265.1052 through 265.1060 (subpart BB, of 40 C.F.R. Part 265). In response (letter dated March 23, 2011) to the EPA's

December 2010 CEI, Apollo submitted a copy of a waste analysis report dated February 4, 2003, reporting a total organic content in their hazardous waste of 1.676 %. Based on the analysis of this result, Apollo determined that their hazardous waste storage tank is not subject to the requirements in subpart BB of 40 C.F.R. Part 265. EPA has determined that Apollo's determination is deficient because it does not include isopropyl alcohol, which the waste stream contains. Therefore, it appears that Apollo has not properly determined the total organic content of their hazardous waste. (Note: If the total organic content is found to be greater that 10%, the tank system would be subject to subpart BB of 40 C.F.R. Part 265)

Apparent Violation:

It appears that Apollo has failed to adhere to some of the conditions for exemption from RCRA Section 3005 given in 40 C.F.R. § 262.34(a)(1)(ii), which incorporates subpart J, BB and CC of 40 C.F.R. Part 265 [as adopted and incorporated by reference in GRHWM § 391-3-11(1)]. At a minimum, it appears that Apollo failed to meet the following requirements:

a. ***Provide secondary containment to some sections of the hazardous waste pipeline that have threaded flanges, valves, fittings and connectors as required in 40 CFR § 265.193(f).***

b. ***Determine the total organic content of the hazardous waste managed in the tank system, as required in 40 C.F.R. § 265.1064(k).***

c. ***Determine the maximum organic vapor pressure of the waste in the tank, as required in 40 C.F.R. § 265.1085(c)(1).***

Therefore, Apollo appears to be in violation of RCRA § 3005 [GHWMA§ 12-8-60(a)]

Wastewater Oil/Water Separator Pretreatment Unit

Apollo operates an oil water separator to treat process bath water prior to discharging it to the publicly owned sewer line. The oily waste stream is accumulated in a 5-gallon container and eventually pumped to the hazardous waste storage tank. At the time of the inspection, the container was properly labeled, closed and appeared to be in good condition. (See picture 9).

Research and Development Laboratory/Quality Control Laboratory

The laboratories are contiguous and operated by the same personnel. In two fume ventilation hoods, Apollo tests aerosol cans by spraying product into cutoff 1-gallon metal containers. From the cutoff containers, the waste is transferred to a 5-gallon accumulation container. All containers were properly labeled and the 5-gallon container was properly closed.

Records Review

During the inspection, the EPA reviewed the following documents:

Training records
Manifests (January 2011 to July 2011)

Inspection records
Contingency plan

In the December 2010 CEI, the EPA alleged that Apollo had failed to comply with the requirements in 40 C.F.R. § 265.16(d), by failing to keep in the facility records the following documents:

- The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;
- A written job description for each hazardous waste management position;
- A written description of the type and amount of both introductory and continuing training that will be given to each person filling hazardous waste management position; and,
- Records that document that the training or job experience required under paragraphs (a), (b) and (c) above.

On March 23, 2011, Apollo responded to the December 2010 CEI and submitted to EPA a copy of the RCRA training program. In the response, Apollo submitted a list that included each employee name, the job title, the type of training required for each position and the hazardous waste activities conducted by the employee. In addition, Apollo provided an overview of the RCRA training and a list of the employees that had received RCRA training. The records indicated Javeed Syed (Safety and Environmental Management) completed his RCRA annual refresher training on November 9, 2010 and that Mr. Syed conducted the facility's RCRA training December 3, 2010. Based on the review of the training records, it appears that Helen Hall (Batch Room Lead Person) had not received RCRA training.

The review of the inspection logs for the hazardous waste tank indicated that Apollo modified the inspection log in response to the EPA's February 2011 inspection report. No deficiencies were observed in the inspection logs, the reviewed manifests, and the November 10, 2010 Contingency Plan.

Apparent Violations:

Pursuant to 40 C.F.R. § 262.34(a)(4) a generator may accumulate hazardous waste in tanks for ninety day or less without a permit or interim status, provided the generator, among other requirements, implements a training program that meets the requirements in 40 C.F.R. § 265.16. Specifically, it appears that Apollo was in violation of 40 C.F.R. § 265.16(c) by failing to provide the required annual refresher training program to Helen Hall. Therefore, Apollo appears to be in violation of RCRA § 3005 [GHWMA§ 12-8-60(a)].

11) Out-Briefing

At the conclusion of the inspection, the inspector informed Apollo's representatives of the preliminary conclusions of the inspection.

12) **Conclusion/Areas of Concerns**

Based on the inspection findings it appears that Apollo was in violation of the following requirements [as adopted and incorporated by reference in GRHWM § 391-3-11(1)]:

40 C.F.R. § 265.173(a) - Failure to keep the pumping station hazardous waste container closed at a time when no waste was being added to or remove.

40 CFR § 265.193(f) – Failure to provide secondary containment to some sections of the hazardous waste pipeline that have threaded flanges, valves, fittings and connectors,

40 C.F.R. § 265.1064(k) – Failure to determine the total organic content of the hazardous managed in the tank system.

40 C.F.R. § 265.1085(c)(1) – Failure to determine the maximum organic vapor pressure of the waste in the storage tank.

40 C.F.R. § 265.16(c) – Failure to provide the required annual refresher training program to Helen Hall. Therefore, Apollo appears to be in violation of RCRA § 3005 [GHWMA§ 12-8-60(a)].

13) **Signed**

Javier E. García, Inspector and
Author of Report

3/13/12
Date

14) **Concurrence/Approval**

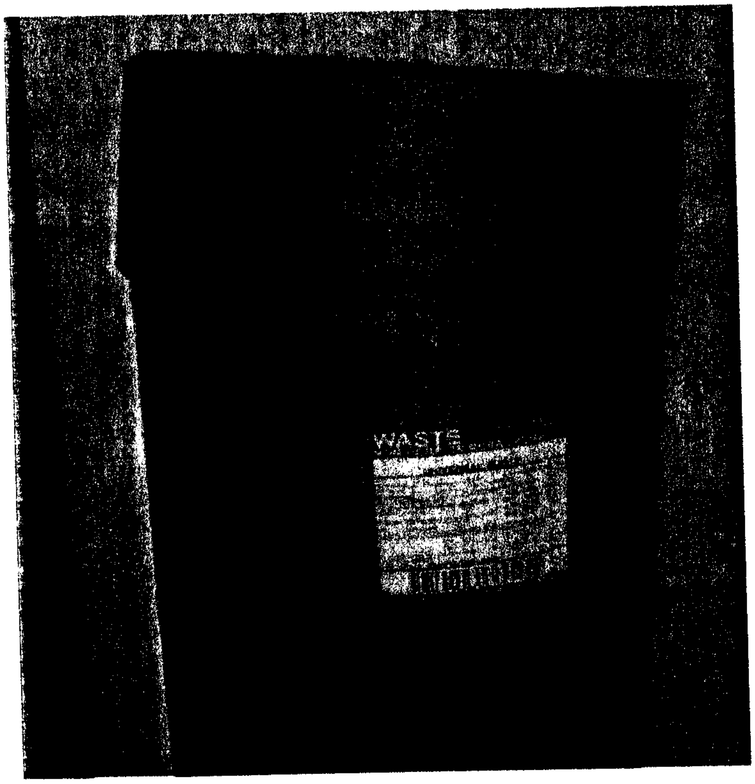
Larry L. Lamberth, Chief
South RCRA and OPA Enforcement and
Compliance Section
RCRA and OPA Enforcement and Compliance Branch

03/19/12
Date

Attachment 1

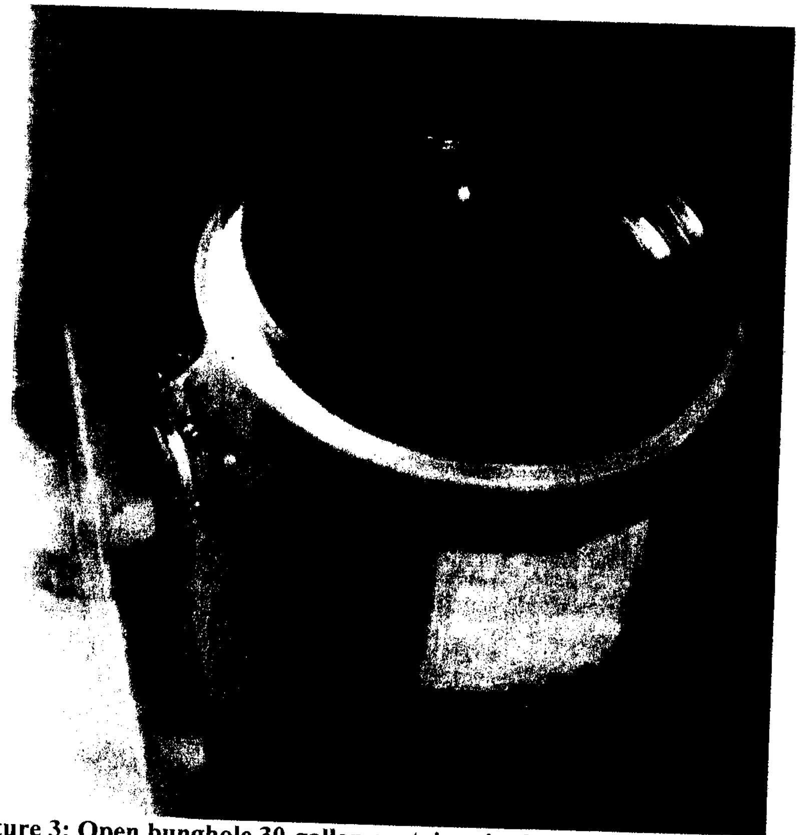
Pictures

Apollo Technologies, Inc.
Smyrna, Georgia
EPA ID NUMBER: GAD 051 021 285

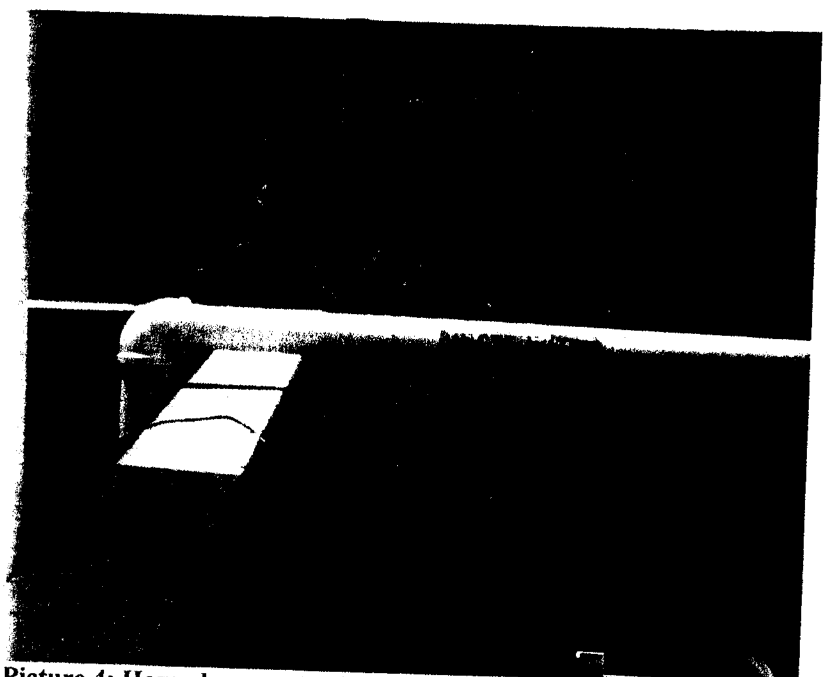


Picture 1: Universal waste lamps accumulation container located near the Break Room.

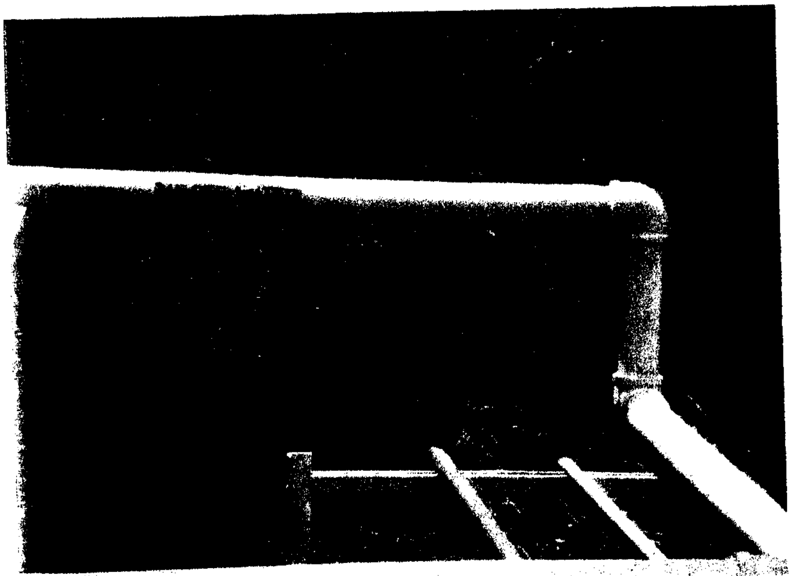
Picture 2: Three 30-gallon containers for the accumulation of hazardous waste generated in the product filling lines.



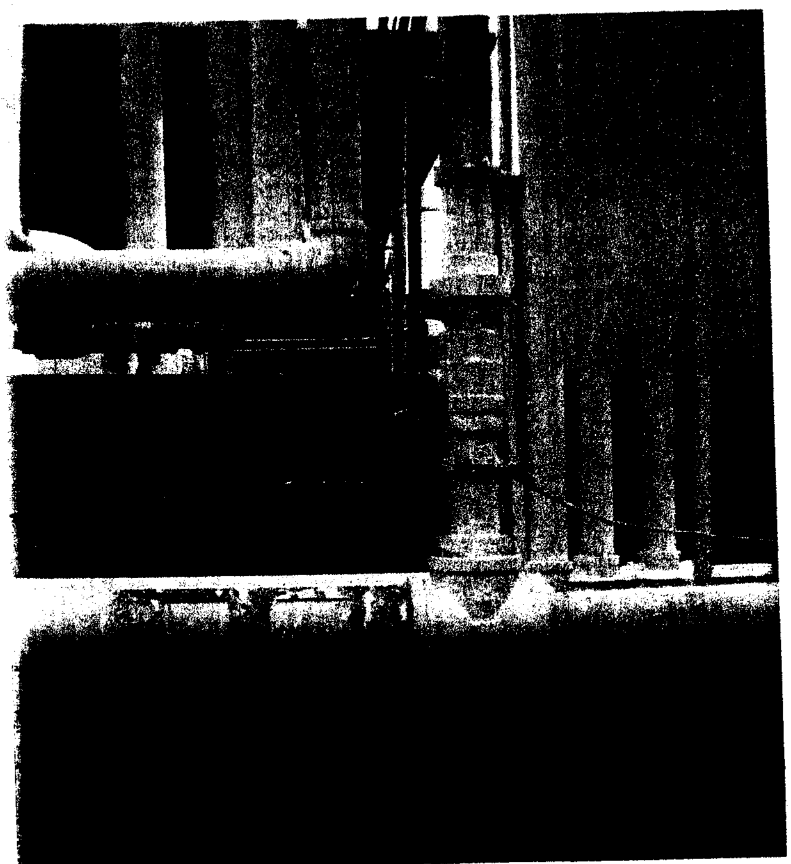
Picture 3: Open bunghole 30-gallon container in the Batch Mixing Room used as the pumping station to transfer hazardous wastes to the storage tank.



Picture 4: Hazardous waste pipeline (labeled as waste water) outside the containment area.



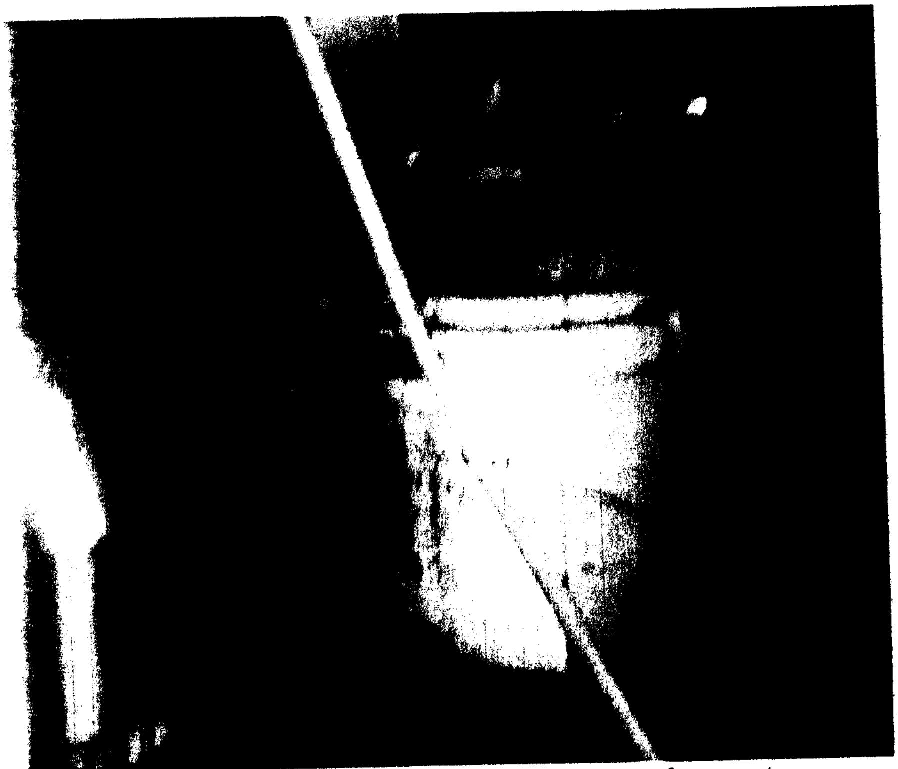
Picture 5: Hazardous waste pipeline (labeled as waste water) outside the containment area.



Picture 6: Hazardous waste pipeline (labeled as waste water) threaded T-connector outside the containment area.

Picture 7: Hazardous waste pipeline (labeled as waste water) threaded T-connector outside the containment area.

Picture 8: Area below a portion of the overhead hazardous waste line where no secondary containment is provided.



Picture 9: Container used for the accumulation of hazardous waste generated in oil-water separator.

C:\My Documents\Apollo Industries\EPA Inspection Report

GARCIA

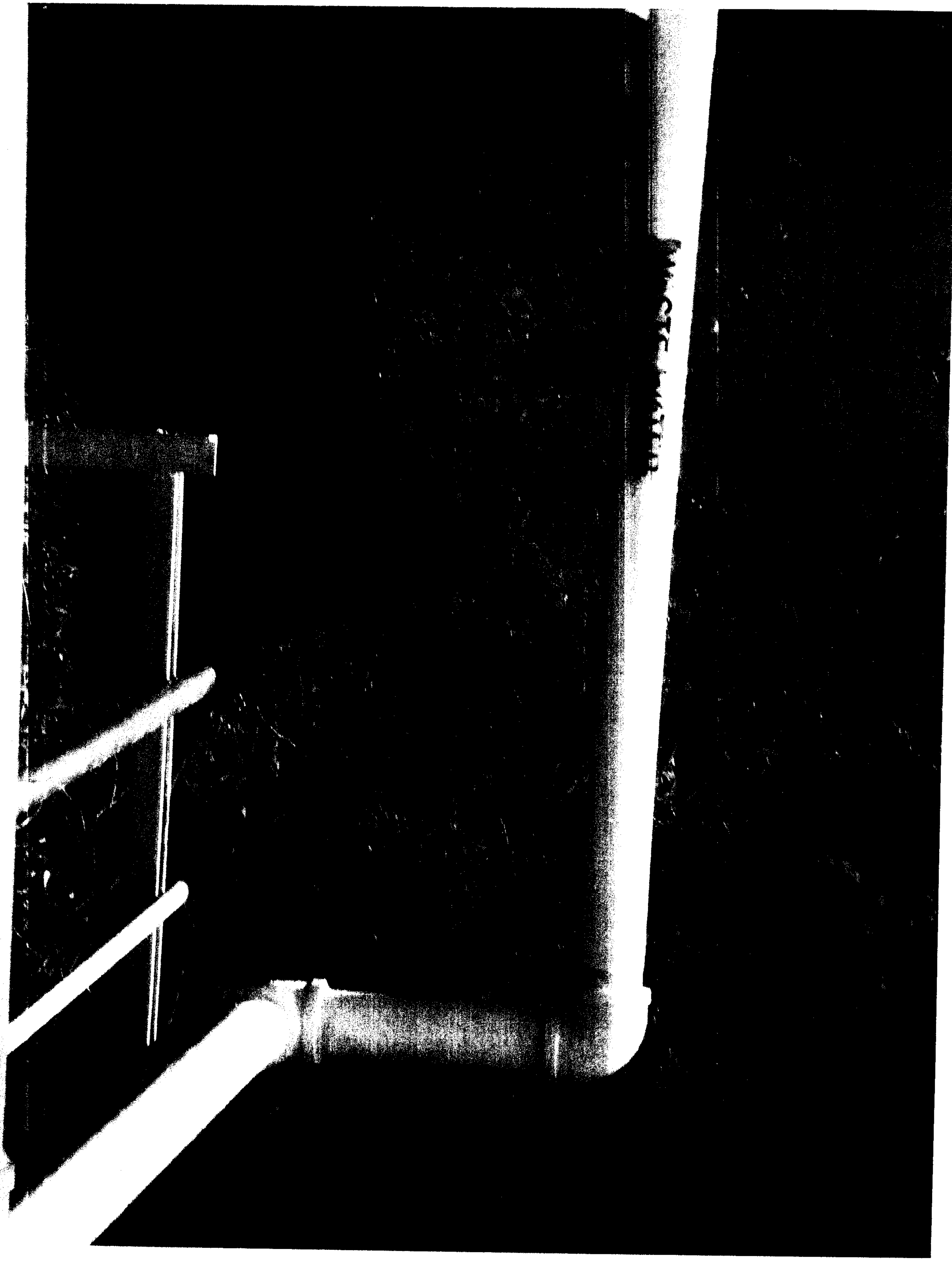
2/14/12

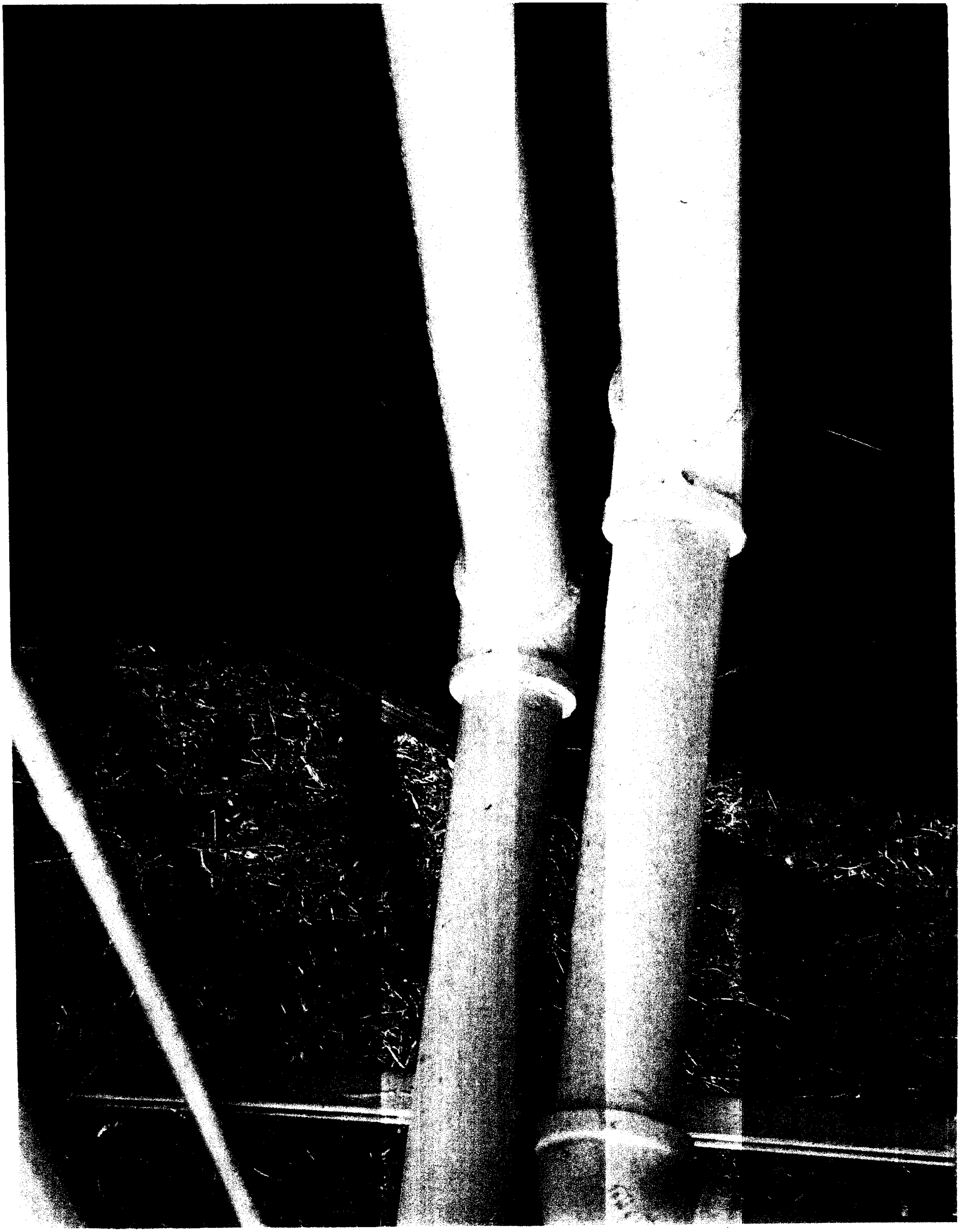
BIAS

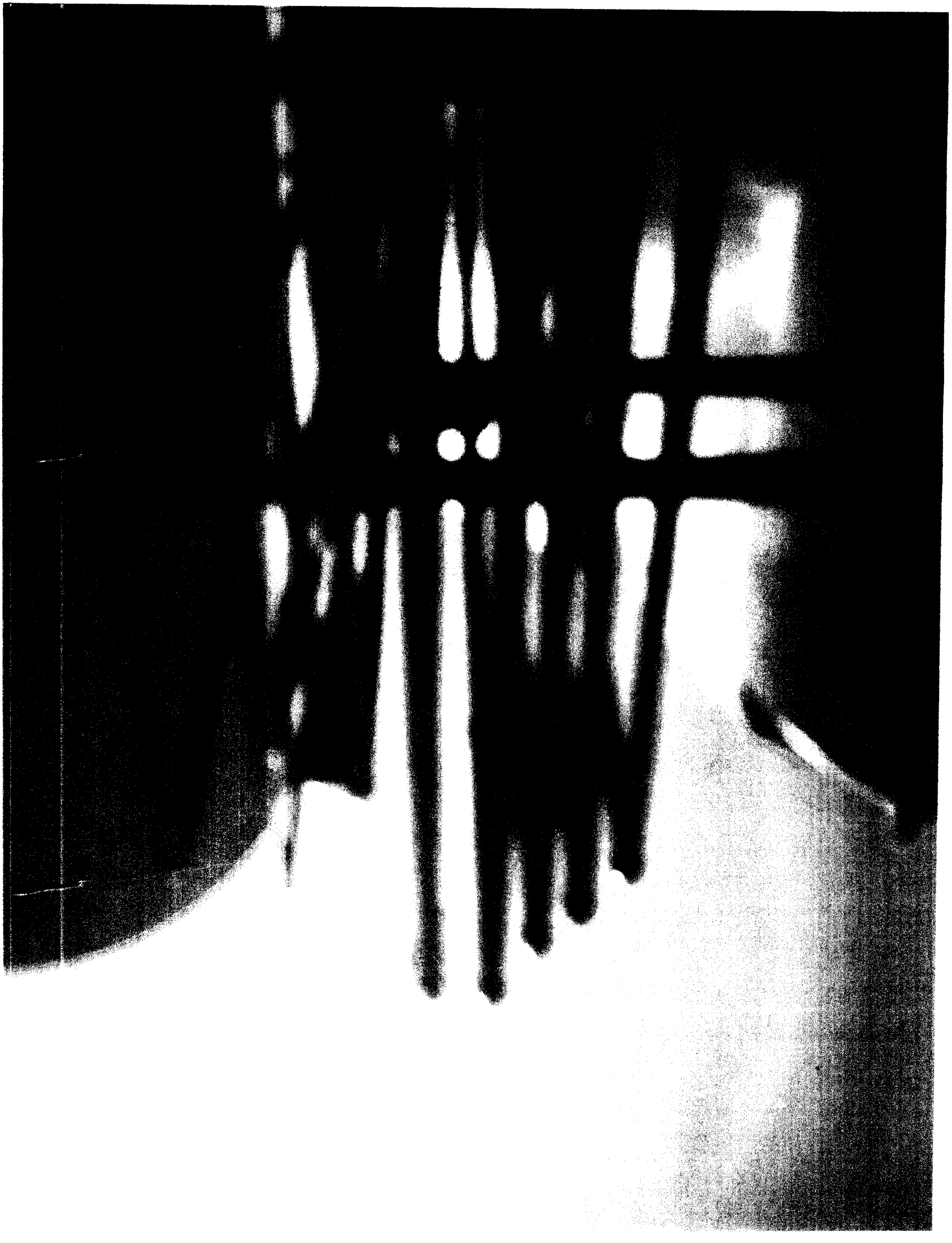
2/23/12
WB

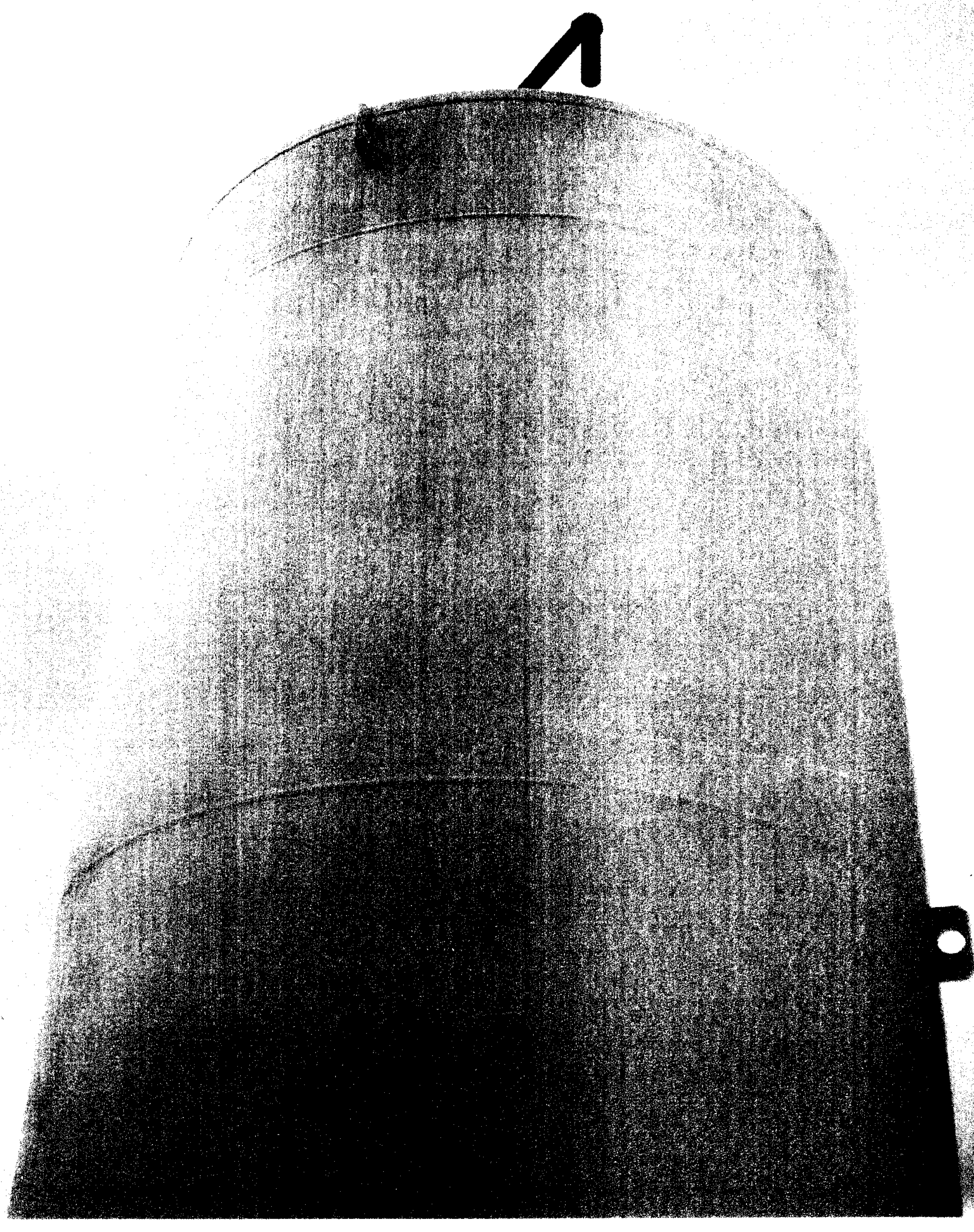
LAMBERTH

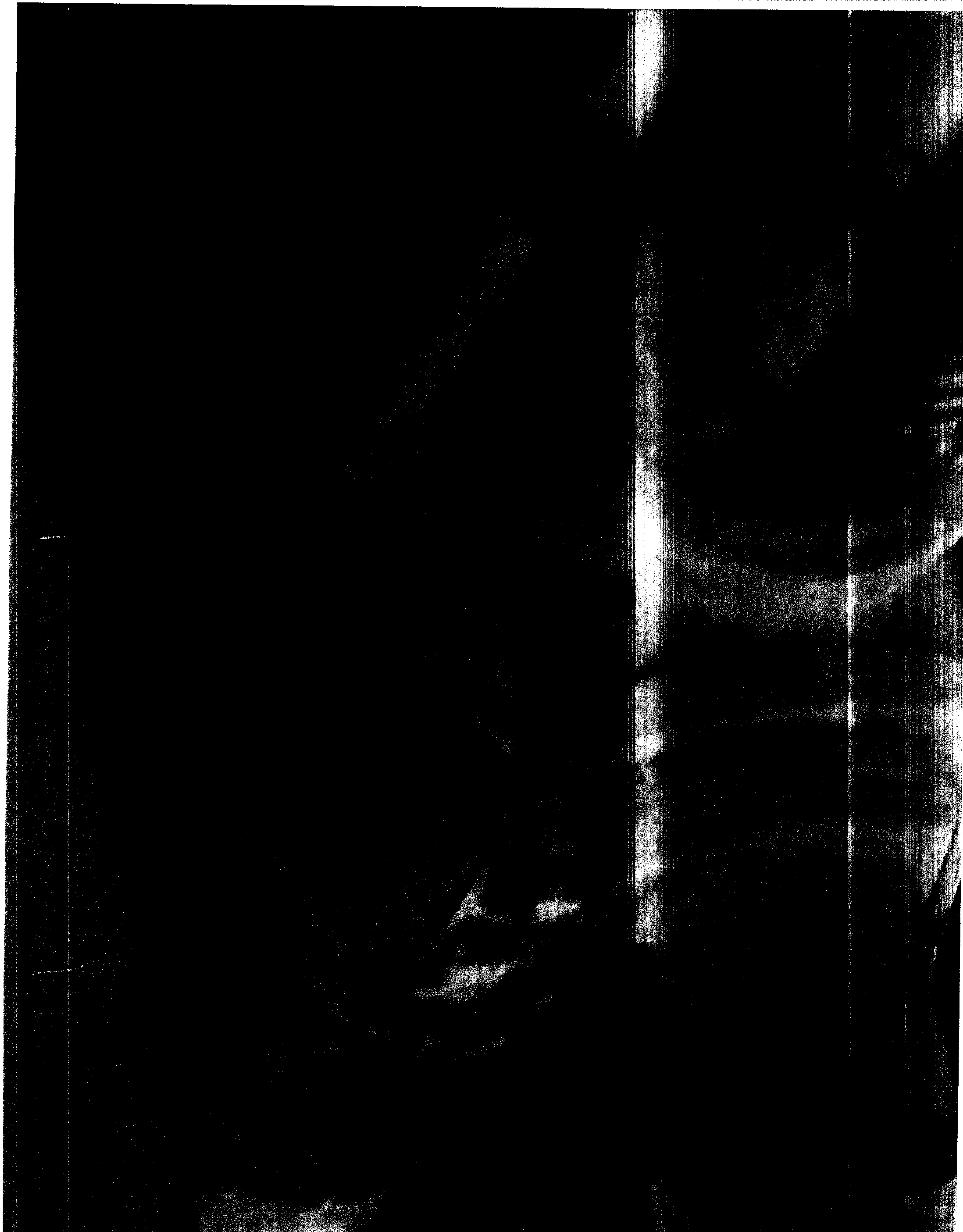
3/19/12

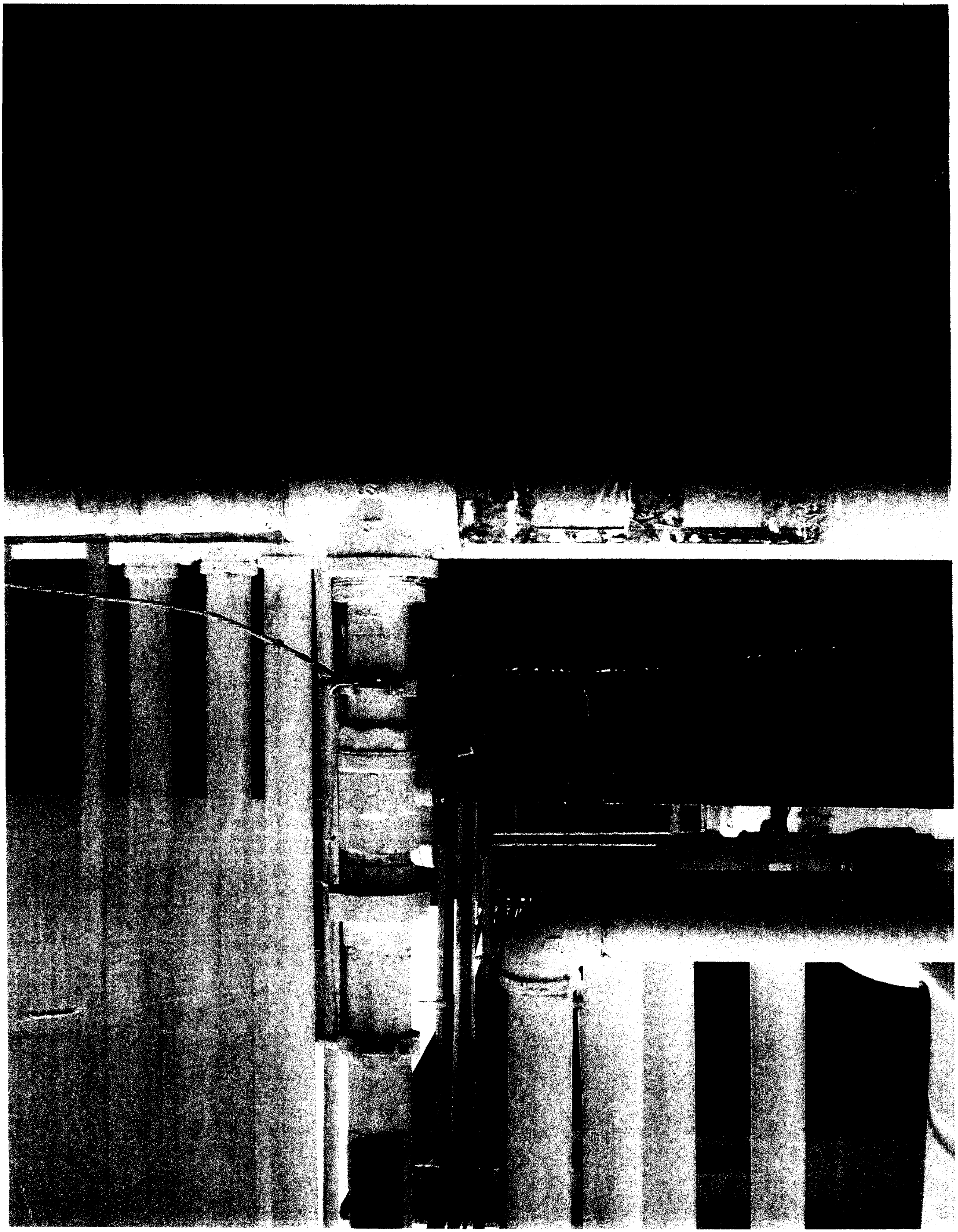


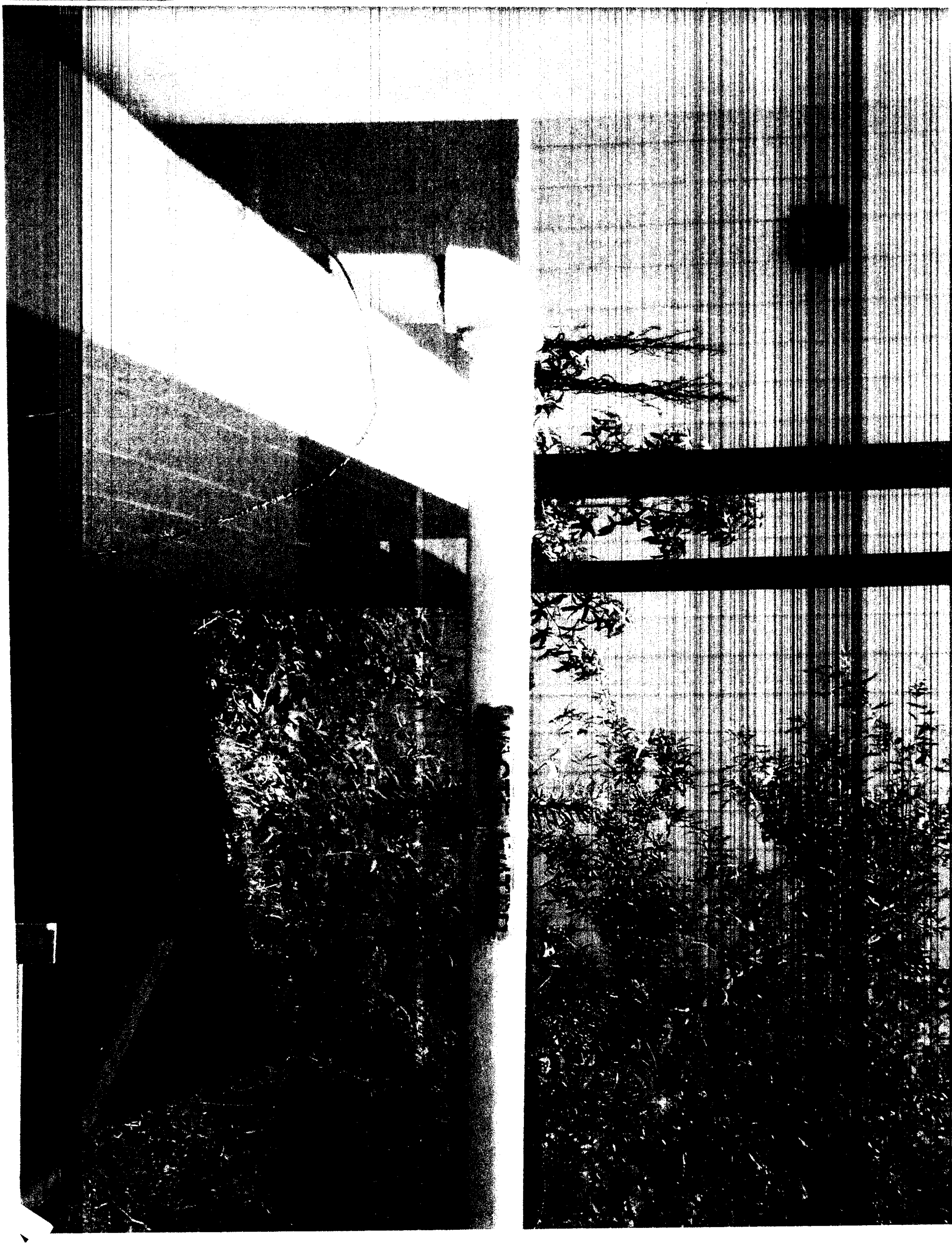












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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

APR 09 2012

Maria Theo-Callas, Chief Executive Officer
Apollo Technologies, Inc.
1850 S. Cobb Industrial Blvd.
Smyrna, Georgia 30082

SUBJ: Notice of Violation (NOV)
Apollo Technologies, Inc.
EPA ID Number GAD 051 021 285

Dear Ms. Theo-Callas:

On December 13, 2010, the Environmental Protection Agency and the Georgia Environmental Protection Division (GAEPD) conducted a Resource Conservation and Recovery Act (RCRA) Compliance Evaluation Inspection (CEI) at the Apollo Technologies, Inc. ("Apollo") facility in Smyrna, Georgia to determine the facility's compliance status with RCRA (December 2010 CEI). On July 26, 2011, the EPA conducted a follow-up CEI at Apollo (July 2011 CEI).

Based on the December 2010 CEI and the July 2011 CEI, the EPA has determined that Apollo has violated requirements of Section 12-8-60, *et. seq.*, of the Georgia Hazardous Waste Management Act (GHWMA) [Subtitle C of RCRA, 42 U.S.C. § 6921, *et seq.*] and the regulations promulgated pursuant thereto at Chapters 391-3-11.08, -.10, and -.18 of the Georgia Hazardous Waste Management Rules (Georgia Rules) [40 C.F.R. Parts 260 - 268, 270, 273 and 279].

Pursuant to Section 391-3-11-.08(1) of the Georgia Rules [40 C.F.R. § 262.34(a)], a generator may accumulate hazardous waste on site for 90 days or less without a permit or without having interim status provided that the generator complies with the management requirements listed in Section 391-3-11-.08(1) of the Georgia Rules [40 C.F.R. § 262.34(a)(1)-(4)] (hereinafter referred to as the "Large Quantity Generator Permit Exemption"). Apollo has violated Section 12-8-66 of the GHWMA [Section 3005 of RCRA, 42 U.S.C. § 6925] by storing hazardous waste without a permit or interim status, because it failed to meet some of the conditions listed in the Large Quantity Generator Permit Exemption. Specifically, Apollo failed to:

1. Determine the total organic content of the hazardous waste managed in its tank system, as required by Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.1064(k)].

2. Determine the maximum organic vapor pressure of the waste in its tank, as required by Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.1085(c)(1)].

Docket No. 769149

3. Inspect all above ground portions of a tank system, to detect corrosion or releases of waste and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system to detect erosion or signs of releases of hazardous waste (*e.g.*, wet spots, dead vegetation), as required in Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.195(b)].

4. Document in the operating record of the facility the inspection of the items required to be inspected in 40 C.F.R. §§ 265.195(b) and (g), as required in Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.195(g)].

5. Provide secondary containment for some sections of its hazardous waste pipeline that have threaded flanges, valves, fittings and connectors as required by Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.193(f)].

6. Maintain training records consistent with the requirements Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.16(d)] which includes keeping the following documents in the facility records:

   a. The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;
   b. A written job description for each hazardous waste management position;
   c. A written description of the type and amount of both introductory and continuing training that will be given to each person filling hazardous waste management position; and,
   d. Records that document that the training or job experience required under 40 C.F.R. § 265.16(a)-(c).

7. Provide annual refresher training to facility personnel consistent with the requirements of Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.16(c)].

In addition, pursuant to Section 391-3-11-.08(1) of the Georgia Rules [40 C.F.R. § 262.34(c)(1)], a generator may accumulate up to 55 gallons of hazardous waste at or near the point of generation without a permit or without having interim status provided that the generator complies with the requirements listed in Section 391-3-11-.08(1) of the Georgia Rules [40 C.F.R. § 262.34(c)(1)(i) and (ii)]. During the December 2010 CEI, Apollo was in violation of Section 12-8-66 of the GHWMA [Section 3005 of RCRA] by failing to:

1. Mark hazardous waste accumulation containers either with the words "Hazardous Waste" or with other words that identify the contents of the containers, as required in Section 391-3-11-.08(1) of the Georgia Rules [40 C.F.R. § 262.34(c)(1)(ii)]. At the time of the December 2010 CEI, Apollo had ten (10) hazardous waste accumulation containers that were not marked. Specifically, the EPA inspector observed the following unmarked containers:

   a. Three (3) containers in the Research and Development Laboratory/Quality Control Laboratory;
   b. One (1) partially full mop bucket with liquids spilled in the Batch Room;
   c. Three (3) metal drip pans to collect drippings from the product filling lines; and,
   d. Three (3) plastic pails collecting drips from filler tanks in filling lines.

2. Keep hazardous waste accumulation containers closed at all times, except when adding or removing waste, as required in Section 391-3-11-.10(1) of the Georgia Rules [40 C.F.R. § 265.173(a)].

   a. At the time of the December 2010 CEI, Apollo had eight (8) hazardous waste accumulation containers that were open when no waste was being added to or removed from the containers. Specifically, the EPA inspector observed the following open containers:
      i. Four (4) containers in the Research and Development Laboratory/Quality Control Laboratory;
      ii. One (1) partially full mop bucket with liquids spilled in the Batch Room;
      iii. Three (3) plastic pails collecting drips from filler tanks.

   b. At the time of the July 2011 CEI, the EPA inspector observed that the bunghole of the 30-gallon container used to pump all hazardous waste generated into the hazardous waste storage tank was open when no waste was being added to or removed from the container.

With this Notice of Violation, the EPA invites Apollo and/or others duly authorized to represent and legally bind Apollo to meet with the EPA by teleconference or at its Regional Office at the Atlanta Federal Center, 61 Forsyth Street, SW, Atlanta, Georgia. During such a meeting or conference call, the representative(s) must be prepared to show cause why the EPA should not take formal enforcement action against Apollo pursuant to Section 3008(a) of RCRA, 42 U.S.C. § 6928(a), for the violations listed above, including the assessment of civil penalties.

Although this proposed meeting is informal in nature, you may elect to be represented by legal counsel. You will be allowed to present information relevant to the factual basis of the EPA's allegations and factors that might mitigate any penalties that may be assessed against Apollo. You should be prepared to provide documentation of all matters presented at the meeting.

If you choose to accept this offer to meet with the EPA, you should contact Javier Garcia, of the RCRA and OPA Enforcement and Compliance Branch, **within fourteen (14) days** of your receipt of this Notice of Violation to set a time and date for the meeting. Javier García can be reached at (404) 562-8616, or by email at garcia.javier@epa.gov. If you decide not to accept this offer, then the EPA may proceed with enforcement action against Apollo, including the assessment of civil penalties.

If you have any technical questions, please contact Javier García. Legal inquiries should be directed to Naeha Dixit, Assistant Regional Counsel, at (404) 562-9441.

Sincerely,

César Zapata, Chief
RCRA and OPA Enforcement and Compliance Branch
RCRA Division

cc: Mr. Mark Smith, GAEPD
Mr. John Fonk, GAEPD

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apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

September 4, 2012

Mr. Cesar Zapata, Chief
United States Environmental Protection Agency - Region 4
South Enforcement Section
RCRA and OPA Enforcement and Compliance Branch
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-8960

Subject: RCRA CA/FO
Apollo Technologies, Inc.
EPA ID Number GAD051021285

Dear Mr. Truman,

Apollo Technologies appreciates the opportunity to provide this additional written response and additional information pertaining to allegations of hazardous waste non-compliance. As you are aware, on March 23, 2011, Apollo Technologies (Apollo) provided a written response to the December 2010 Compliance Evaluation Inspection (CEI) report dated February 10, 2011. In this written response Apollo provided specific information on several EPA alleged violations. Since this time, an NOV dated April 9, 2012 was prepared and issued followed by a CA/FO issued on August 22, 2012, which still continue to indicate several alleged violations that have been determined by Apollo to have inaccuracies. Please note that Apollo would certainly be available to meet in person with EPA representatives to further clarify these issues.

Additionally, over the last few months Apollo has been implementing additional actions to build upon its existing hazardous waste training and management systems since the original CEI and through the time period in which the NOV and CA/FO have been issued. Due to delays in receiving complete reports from third party consultants (e.g. tank integrity and leak detection assessment) and with the transition of a new EHS manager to Apollo, the time required to prepare and provide additional information to EPA has been longer than anticipated.

The following information is being provided to further convey the waste minimization processes and product recovery efforts being made by Apollo, to explain when an actual waste determination is made, the training documentation that has been in place for several years, and to provide the basis on why some of the allegations made by EPA are not considered appropriate.

Docket No. 769154

CA/FO Paragraphs 43 and 45 (identification of hazardous waste containers)

Prior to beginning any additional discussion on the container and product management systems at Apollo, it is important to note the definition of a solid waste. As EPA has accurately indicated in the definitions within the CA/FO, EPA defines the term Solid Waste as "any discarded material that is not otherwise excluded by regulation. A discarded material includes any material that is abandoned by being stored in lieu of being disposed."

First, the containers that are used within the laboratory for testing aerosol spray effectiveness are use to capture product from the test cans. This product may have additional testing performed upon it after the aerosol is sprayed into the can. Upon determination that the captured product no longer requires any additional evaluation, the material is then discarded, and at this point the material is placed in the designated Satellite Accumulation Area (SAA) waste container. Since the product becomes a waste upon this determination, it is immediately assumed by Apollo that this discarded material is likely hazardous and is appropriate managed as a hazardous waste. It is not accurate to indicate that a material is a hazardous waste until a determination is made that this material meets the definition of a solid waste. Apollo has always conservatively managed all laboratory waste from aerosol spray tests as a hazardous waste, after determination has been made this material in the containers is made that it is a solid waste. It is not appropriate to require that these containers be identified as hazardous waste containers or required to be closed when the solid waste determination is not applicable at that point of the process.

Apollo utilizes efforts to reduce the amount of hazardous waste generated in the production process and also to implement good housekeeping measures to capture small spills associated with the can filling process. The nature of these filling machines, and for any filling machine, is that there will be occasional spills due to a variety of reasons. As visually observed by EPA representatives, Apollo has installed pans used to capture such drips and spills in the filling process and these pans direct spilled product into 5-gallon open top plastic buckets. The product that is captured in these buckets is evaluated to determine if it can be immediately returned to the associated product supply tank for the filler, returned to the beginning of the filling process to the primary product batch tank, held for a future production run. Upon evaluation of the product captured in these buckets, a determination may be made that this material cannot be recovered and at this point the product is determined to be a solid waste and is transferred to a SAA to be conservatively managed as a hazardous waste (note-in many cases this material is water based and could potentially be non-hazardous if a TCAP, I, C, R characterization was to be performed). It is not appropriate to require that these 5-gallon containers be identified as hazardous waste containers or required to be closed when the solid waste determination is not applicable at that point of the process. Upon determination that the recovered material cannot be used as product it is immediately transferred to a designated hazardous waste container.

In order to further minimize the potential loss of spilled product, Apollo has installed stainless steel secondary containment floor pans underneath the fillers to further collect over spray or spills of product and additionally proved secondary containment for the 5-gallon product recovery buckets. Apollo also follows the same procedure as described above and would recover any appreciable liquid product within these pans prior to making the determination that this material be discarded. In most operating scenarios, only a minimal amount of product is spilled into the secondary containment pans and this is immediately removed via rags that are disposed of as a solid hazardous waste. Since these secondary containment pans are used only to provide spill containment and in some cases allow the spilled product to be recovered for re-use, it is not appropriate to define these floor spill pans as hazardous waste containers.

During the CEI, a mop bucket was observed and subsequently classified as a hazardous waste container. This mop bucket is used to clean the floor surfaces with wash solution typically consisting of water and methanol, or water and soap mixture. In order to reduce waste, a mop wash water solution is prepared typically at the beginning of the work day/production shift and utilized throughout the day to clean the floor and remove small spills from the process. When the wash water and mop solution is ready to be discarded at the end of the day or production period, and thus the determination is made that this material is a waste, the wash water is pumped directly to the hazardous waste storage tank. In cases where a larger spill may occur, a separate mop would be utilized and this mop head would be directly disposed as a solid hazardous waste. Since the wash water that is contained in the mop bucket is not a waste while it is still in use, it is not appropriate to define a mop bucket as a hazardous waste container.

CA/FO Paragraphs 48 and 50 (Total Organic Carbon and Vapor Pressure Determination)

As explained in Apollo's CEI response dated March 23, 2011, organic waste vapor pressure and TOC determinations had been completed in the past through periodic analysis and waste profiles that were prepared by waste handlers and through generator knowledge. Apollo had assumed that based on this information, the characteristics of the liquid hazardous waste were such that the waste TOC were below 10%. Subsequent to the NOV, additional waste evaluations have been made including 2 total volatile analysis and one TCLP analysis to complete a waste characterization based on analytical data rather than generator knowledge and upon data that was previously collected several years in the past. Based on this analysis, an updated waste characterization has been prepared and is provided as Attachment 1. The results of this analysis indicate that the liquid hazardous waste should be characterized as having a TOC content exceeding 10%.

Subsequent to completion of this waste determination, Apollo hired a third party contractor, Resolve Engineering, to complete a tank integrity assessment and vapor leak detection monitoring for the hazardous waste system. The results of these tests are provided as Attachment 2. The results of the leak detection have shown that there are no system leaks and in most cases all vapor concentration readings are zero or less than 500 ppm. These results indicate that the system can continue to be assessed on an annual basis.

In addition to the completion of the tank integrity assessment and leak detection testing, an updated carbon treatment system evaluation was completed. Upon testing of the previous carbon system, it was found that the carbon was experiencing breakthrough of organic vapors, with inlet concentrations reading in the 8,000 ppm range and outlet concentrations reading 300ppm using a portable organic vapor analyzer. Based on this discovery, the organic vapor treatment system (Carbon adsorption) has been expanded to utilize a larger carbon system. This evaluation and associated supporting information is provided as Attachment 3. It is currently estimated that the new carbon adsorption system will provide approximately a 9-month control capacity prior to organic vapor breakthrough. Apollo will be performing weekly monitoring of both the inlet and outlet of the carbon system to assure that the system meets both a 95% control efficiency and outlet concentration of less than 500ppm.

CA/FO Paragraph 52 and 54 (Failure to Conduct Hazardous Waste Tank System Inspections)

Apollo has consistently completed inspections of the hazardous waste tank system including all piping and containment areas to assess for any signs of leaks, spills, or structural issues associated with the storage tank, piping, and containment systems. The inspection forms previously utilized by Apollo did not indicate all specific areas being inspected; however, this cannot be interpreted to assume that since these items were not specifically cited on the inspection form that they were not done. Beginning in April 2011, the inspection form was modified to include more details on the required elements of the routine inspections and these inspection forms will continue to be evaluated over time to improve upon them. Copies of the older and new inspection forms are provided as Attachment 4. Given that the recent third party tank and integrity assessment did not indicate any leaks or structural issues in the system, and given that Apollo has not made any additional repairs or modifications to the system (other than painting all transfer lines red for more designation of the hazardous waste piping systems); there is nothing which would indicate that the inspections were not performed properly.

CA/FO Paragraph 56 (Hazardous Waste Tank Transfer Line Secondary Containment)

The area of piping associated with the line used to pump out the liquid hazardous waste from the storage tank was observed during the CEI to be located outside of the secondary containment area. Since the time of this observation, a secondary containment pad was constructed and a chemical resistant coating has been applied. A copy of the coating specification sheet is provided at Attachment 5. It is also noted that the results of the tank and system integrity assessment indicate that there are no systems leaks or integrity issues associated with any of the system piping.

CA/FO Paragraph 58 (Failure to maintain training records pertaining to hazardous waste)

Apollo has always maintained documentation of the specific job title and position for all employees within the company. This information is maintained by human resources and indicates a specific department code associated with each employee by name. An example copy of this information is provided as Attachment 6. Apollo also has had documentation that has been used to describe the work duties associated with each of these identified positions within a Production SOP documentation system. Other job function specific duties are defined under other sections of Apollo's SOP library related to QA/QC and other functional areas. A copy of the Production SOP Index (older version -02 and new version -03) is provided as Attachment 7. Apollo admits that this information was not clearly identified in the hazardous waste training program information at the time of the CEI, but has always utilized this to assure that each individual within a specific position was properly trained, including applicable hazardous waste management elements. Previous documentation of training was simply indicated as Hazardous Waste under the category of Types of Training as shown in the training record dated December 3, 2010 (prior to the CEI) and provided as Attachment 8.

Subsequent to the CEI and NOV, Apollo has developed additional hazardous waste management program documentation and SOPs to improve its training programs. Copies of these new programs, training materials (both English and Spanish), and SOPs are provided, along with a revised SOP Production Index PRP-000-02, as Attachment 9.

In closing, Apollo appreciates your additional consideration and hopes this additional information will provide a better understanding of Apollo's operations. Please feel free to contact me at (770) 433-0210, extension 1242, should you have any questions or concerns.

Sincerely,

Christopher Hurst
Vice President, EHS
Apollo Industries, Inc.

Attachments (9)

copy: Maria Theo-Callas, Apollo
Barbara Gallo, Krevolin & Horst LLC
Naeha Dixit, US EPA Region 4

ATTACHMENT 1

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Apollo Industries Smyrna Bulk Liquid Hazardous Waste Characterization and Waste Analysis Plan

Apollo Industries operates a bulk hazardous waste liquid management system for management of all site generated liquid wastes. The majority of this waste is water based in nature. However, there are also various organic compounds present within the waste stream.

Apollo Industries has developed a process for characterizing this hazardous waste stream in accordance with the provisions of 265.1063(d)(3), by reviewing the processes in which the waste was produced and by obtaining periodic representative samples (minimum of once per calendar quarter) of this waste and analyzing this waste stream for total volatile organic compounds (method 8260) and performing annual TCLP (Volatile fractions) analysis along with Ignitability, Corrosivity, and Reactivity in accordance with standard EPA methods. Representative waste samples will be collected directly from the hazardous waste tank. All analysis will be completed by a Georgia laboratory that is properly accredited with NELAC.

The purpose of this analysis is to verify waste characteristics, and to determine the total organic content, total vapor pressure, and hazardous properties associated with this waste stream. Attached with this cover sheet are copies of all waste analysis and data table summaries of each analysis which documents the characteristics of this waste stream.

Based on the current set of analytical data the following characteristics have been determined for the Smyrna liquid hazardous waste stream.

Total Organic Content: >10%
Maximum Organic Vapor Pressure: 0.5 psi (3.15 kPa)

LEVEL 1

Table 1
Apollo Industries
Hazardous Waste Sampling Results 8/13/2010

Parameter	Result	Units	Result	Units	Percentage	Molecular Weight	Vapor Pressure (kPa @20°C)	mm mg	Psi	Partial Pressure (kPa @20C)
Acrylonitrile	370000	ug/Kg	370	ppm	0.04%	53.03	11.12	83.4	1.6124	0.0041
Xylenes, total	13000000	ug/Kg	13000	ppm	1.30%	106.17	0.9	6.75	0.1305	0.0117
Tetrachloroethene	26000000	ug/Kg	26000	ppm	2.60%	165.83	1.7	12.75	0.2465	0.0442
Toluene	23000000	ug/Kg	23000	ppm	2.30%	92.14	2.7	20.25	0.3915	0.0621
Trichloroethene	19000000	ug/Kg	19000	ppm	1.90%	131.39	7.8	58.5	1.131	0.1482
Ethylbenzene	3900000	ug/Kg	3900	ppm	0.39%	106.17	0.95	7.125	0.13775	0.0037

Total Organic Content	85270	ppm	8.53%
Water = Remaining Content	914730	ppm	91.47%

Vapor Mixture: 0.2740 kPa
2.0551 mm mg
0.0397 psi

1 kilopascal = 0.145 037 738 01 pound/square inch
1 kilopascal = 7.500 615 613 millimeter of mercury [0 °C]

Table 2
Apollo Industries
Hazardous Waste Sampling Results 5/8/2012

Parameter	Result	Units	Result	Units	Percent	Molecular Weight	Vapor Pressure (kPa @20°C)	Partial Pressure	mm mg	Psi	Partial Pressure (kPa @20C)	
Acetone	130000000	ug/L	130000	ppm	13.00%	58.08	24.2	3.146	23.595	0.45617	3.1460	
Trichloroethene	73000	ug/L	73	ppm	0.01%	131.39	7.8	0.000569	0.004271	8.26E-05	0.0006	
CALPRINT 35	34000	mg/Kg	34000	ppm	3.40%	196.20	0.01	0.00034	0.00255	4.93E-05	0.0003	
Total Organic Content			164073	ppm	16.41%							
Water = Remaining Content			835927	ppm	83.59%		2.3			Vapor Mixture:	3.1469	kPa
											23.6018	mm mg
											0.4563	psi

1 kilopascal = 0.145 037 738 01 pound/square inch
1 kilopascal = 7.500 615 613 millimeter of mercury [0 °C]

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3580)**		Analyst: **KDD**
4,4´-DDD	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
4,4´-DDE	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
4,4´-DDT	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Aldrin	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
alpha-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
alpha-Chlordane	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
beta-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Chlordane	BRL	98		mg/Kg	133786	20	8/19/2010 2:01 PM
delta-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Dieldrin	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endosulfan I	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Endosulfan II	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endosulfan sulfate	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endrin	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endrin aldehyde	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endrin ketone	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
gamma-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
gamma-Chlordane	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Heptachlor	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Heptachlor epoxide	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Methoxychlor	BRL	9.8		mg/Kg	133786	20	8/19/2010 2:01 PM
Toxaphene	BRL	98		mg/Kg	133786	20	8/19/2010 2:01 PM
Surr: Decachlorobiphenyl	83.8	30-150		%REC	133786	20	8/19/2010 2:01 PM
Surr: Tetrachloro-m-xylene	58.0	30-150		%REC	133786	20	8/19/2010 2:01 PM
POLYCHLORINATED BIPHENYLS SW8082A					**(SW3580)**		Analyst: **KDD**
Aroclor 1016	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1221	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1232	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1242	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1248	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1254	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1260	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Surr: Decachlorobiphenyl	165	45.4-192		%REC	133785	10	8/19/2010 12:48 PM
Surr: Tetrachloro-m-xylene	93.2	40.3-187		%REC	133785	10	8/19/2010 12:48 PM
CHLORINATED HERBICIDES SW8151A					**(SW3580)**		Analyst: **AK**
2,4,5-T	BRL	2000		ug/Kg	133784	1	8/18/2010 7:52 PM
2,4,5-TP (Silvex)	BRL	2000		ug/Kg	133784	1	8/18/2010 7:52 PM
2,4-D	BRL	2000		ug/Kg	133784	1	8/18/2010 7:52 PM
Dinoseb	BRL	4900		ug/Kg	133784	1	8/18/2010 7:52 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
CHLORINATED HERBICIDES SW8151A					**(SW3580)**		Analyst: **AK**
Surr: DCAA	86.8	20-127		%REC	133784	1	8/18/2010 7:52 PM
APPENDIX IX METALS SW6010C					**(SW3050B)**		Analyst: **TAA**
Antimony	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Arsenic	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Barium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Beryllium	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Cadmium	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Chromium	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Cobalt	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Copper	0.694	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Lead	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Nickel	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Selenium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Silver	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Thallium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Tin	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Vanadium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
TOTAL MERCURY - WASTE SW7471B					**(SW7471)**		Analyst: **MP**
Mercury	BRL	0.100		mg/Kg	133666	1	8/17/2010 2:48 PM
APPENDIX IX-SEMIVOLATILE ORGANICS	**SW8270D**				**(SW3550C)**		Analyst: **YH**
1,2,4,5-Tetrachlorobenzene	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
1,2,4-Trichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,2-Dichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,3-Dichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,3-Dinitrobenzene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
1,4-Dichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,4-Napthoquinone	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1-Naphthylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
2,3,4,6-Tetrachlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4,5-Trichlorophenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4,6-Trichlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dichlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dimethylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dinitrophenol	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dinitrotoluene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,6-Dichlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,6-Dinitrotoluene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Acetylaminofluorene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX-SEMIVOLATILE ORGANICS	**SW8270D**				**(SW3550C)**		Analyst: **YH**
2-Chloronaphthalene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Chlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Methylnaphthalene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Methylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Naphthylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Nitroaniline	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Nitrophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Picoline	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
3,3´-Dichlorobenzidine	BRL	660		ug/Kg	133832	1	8/18/2010 6:56 PM
3,3´-Dimethylbenzidine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
3,4-Methylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
3-Methylcholanthrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
3-Nitroaniline	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4,6-Dinitro-2-methylphenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Aminobiphenyl	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Bromophenyl phenyl ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Chloro-3-methylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Chloroaniline	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Chlorophenyl phenyl ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Nitroaniline	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Nitrophenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Nitroquinoline,1-oxide	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
5-Nitro-o-toluidine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
7,12-Dimethylbenz(a)anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
a,a-Dimethylphenethylamine	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Acenaphthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Acenaphthylene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Acetophenone	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Aniline	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Aramite	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benz(a)anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(a)pyrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(b)fluoranthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(g,h,i)perylene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(k)fluoranthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzyl alcohol	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Bis(2-chloroethoxy)methane	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Bis(2-chloroethyl)ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Bis(2-chloroisopropyl)ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX-SEMIVOLATILE ORGANICS	**SW8270D**				**(SW3550C)**		Analyst: **YH**
Bis(2-ethylhexyl)phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Butyl benzyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Chlorobenzilate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Chrysene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Diallate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Dibenz(a,h)anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Dibenzofuran	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Diethyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Dimethoate	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Dimethyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Di-n-butyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Di-n-octyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Diphenylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Disulfoton	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Ethyl methanesulfonate	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Famphur	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Fluoranthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Fluorene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorobenzene	BRL	9.9		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorobutadiene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorocyclopentadiene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachloroethane	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorophene	BRL	790		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachloropropene	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Indeno(1,2,3-cd)pyrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Isodrin	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Isophorone	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Isosafrole	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Kepone	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Methapyrilene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Methyl methanesulfonate	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Methyl parathion	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Naphthalene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Nitrobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodiethylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodimethylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitroso-di-n-butylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodi-n-propylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodiphenylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosomethylethylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX-SEMIVOLATILE ORGANICS	**SW8270D**				**(SW3550C)**		Analyst: **YH**
N-Nitrosomorpholine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosopiperidine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosopyrrolidine	BRL	400		ug/Kg	133832	1	8/18/2010 6:56 PM
O,O,O-Triethylphosphorothioate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
o-Toluidine	BRL	400		ug/Kg	133832	1	8/18/2010 6:56 PM
Parathion	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
p-Dimethylaminoazobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pentachlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pentachloronitrobenzene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Pentachlorophenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Phenacetin	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Phenanthrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Phenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Phorate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
p-Phenylenediamine	BRL	5000		ug/Kg	133832	1	8/18/2010 6:56 PM
Pronamide	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pyrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pyridine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Safrole	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Sym-Trinitrobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Tetraethyl dithiopyrophosphate	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Thionazin	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Surr: 2,4,6-Tribromophenol	115	44.1-135		%REC	133832	1	8/18/2010 6:56 PM
Surr: 2-Fluorobiphenyl	84.8	48.1-120		%REC	133832	1	8/18/2010 6:56 PM
Surr: 2-Fluorophenol	76.8	37.6-120		%REC	133832	1	8/18/2010 6:56 PM
Surr: 4-Terphenyl-d14	89.5	46-122		%REC	133832	1	8/18/2010 6:56 PM
Surr: Nitrobenzene-d5	114	39.1-120		%REC	133832	1	8/18/2010 6:56 PM
Surr: Phenol-d5	87.4	44-120		%REC	133832	1	8/18/2010 6:56 PM
APPENDIX IX VOLATILE ORGANICS	**SW8260B**				**(SW5030B)**		Analyst: **AR**
1,1,1,2-Tetrachloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1,1-Trichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1,2-Trichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1-Dichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1-Dichloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2,3-Trichloropropane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dibromoethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dichlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT: Krevolin & Horst, LLC
Project: Apollo Industries
Lab ID: 1008B22-001

Client Sample ID: TRIP BLANK
Collection Date: 8/13/2010 12:50:00 PM
Matrix: WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX VOLATILE ORGANICS SW8260B					**(SW5030B)**		Analyst: **AR**
1,2-Dichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dichloropropane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,3-Dichlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,4-Dichlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,4-Dioxane	BRL	150		ug/L	133814	1	8/18/2010 7:32 PM
2-Butanone	BRL	50		ug/L	133814	1	8/18/2010 7:32 PM
2-Hexanone	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
4-Methyl-2-pentanone	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Acetone	BRL	50		ug/L	133814	1	8/18/2010 7:32 PM
Acetonitrile	BRL	100		ug/L	133814	1	8/18/2010 7:32 PM
Acrolein	BRL	20		ug/L	133814	1	8/18/2010 7:32 PM
Acrylonitrile	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Allyl Chloride	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Benzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Bromodichloromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Bromoform	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Bromomethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Carbon disulfide	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Carbon tetrachloride	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Chlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Chloroethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Chloroform	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Chloromethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Chloroprene	BRL	20		ug/L	133814	1	8/18/2010 7:32 PM
cis-1,3-Dichloropropene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Dibromochloromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Dibromomethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Dichlorodifluoromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Ethyl Methacrylate	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Ethylbenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Iodomethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Isobutyl Alcohol	BRL	200		ug/L	133814	1	8/18/2010 7:32 PM
Methyl Methacrylate	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Methylacrylonitrile	BRL	200		ug/L	133814	1	8/18/2010 7:32 PM
Methylene chloride	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Naphthalene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Pentachloroethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Propionitrile	BRL	100		ug/L	133814	1	8/18/2010 7:32 PM
Styrene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Tetrachloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX VOLATILE ORGANICS SW8260B					**(SW5030B)**		Analyst: **AR**
Toluene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
trans-1,2-Dichloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
trans-1,3-Dichloropropene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
trans-1,4-Dichloro-2-butene	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Trichloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Trichlorofluoromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Vinyl acetate	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Vinyl chloride	BRL	2.0		ug/L	133814	1	8/18/2010 7:32 PM
Xylenes, Total	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Surr: 4-Bromofluorobenzene	96.1	60.1-127		%REC	133814	1	8/18/2010 7:32 PM
Surr: Dibromofluoromethane	102	79.6-126		%REC	133814	1	8/18/2010 7:32 PM
Surr: Toluene-d8	98.2	78-116		%REC	133814	1	8/18/2010 7:32 PM
VOLATILE ORGANIC COMPOUNDS BY GC/MS SW8260B					**(SW5035)**		Analyst: **AR**
1,4-Dioxane	BRL	5000000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acetonitrile	BRL	3300000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Allyl Chloride	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloroprene	BRL	670000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Ethyl Methacrylate	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Isobutyl Alcohol	BRL	6700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Methyl Methacrylate	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Methylacrylonitrile	BRL	6700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Pentachloroethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Propionitrile	BRL	3300000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Dichlorodifluoromethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloromethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Vinyl chloride	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Bromomethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloroethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Trichlorofluoromethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acrolein	BRL	670000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1-Dichloroethene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acetone	BRL	3300000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Iodomethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Carbon disulfide	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Vinyl acetate	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Methylene chloride	BRL	1700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acrylonitrile	370000	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
trans-1,2-Dichloroethene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1-Dichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS SW8260B				(SW5035)			Analyst: **AR**
2-Butanone	BRL	1700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloroform	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,1-Trichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Carbon tetrachloride	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Benzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Trichloroethene	19000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
1,2-Dichloropropane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Dibromomethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Bromodichloromethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
cis-1,3-Dichloropropene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
4-Methyl-2-pentanone	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Toluene	23000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
trans-1,3-Dichloropropene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,2-Trichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
2-Hexanone	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Tetrachloroethene	26000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
Dibromochloromethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dibromoethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,1,2-Tetrachloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Ethylbenzene	3900000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
Styrene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Bromoform	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,2,2-Tetrachloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2,3-Trichloropropane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
trans-1,4-Dichloro-2-butene	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,3-Dichlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,4-Dichlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dichlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dibromo-3-chloropropane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Naphthalene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Xylenes, Total	13000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
Surr: 4-Bromofluorobenzene	97.0	58.2-140		%REC	133658	50000	8/19/2010 2:04 PM
Surr: 4-Bromofluorobenzene	102	58.2-140		%REC	133658	5000	8/18/2010 10:12 PM
Surr: Dibromofluoromethane	103	71.1-132		%REC	133658	50000	8/19/2010 2:04 PM
Surr: Dibromofluoromethane	98.8	71.1-132		%REC	133658	5000	8/18/2010 10:12 PM
Surr: Toluene-d8	99.2	77.6-119		%REC	133658	50000	8/19/2010 2:04 PM
Surr: Toluene-d8	99.1	77.6-119		%REC	133658	5000	8/18/2010 10:12 PM

Qualifiers:

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BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	TRIP BLANK
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
CYANIDE, TOTAL SW9014					**(SW9010)**		Analyst: **CG**
Cyanide, Total	BRL	0.990		mg/Kg	133868	1	8/18/2010 2:35 PM
SULFIDE BY SW9030/9034					**(SW9030)**		Analyst: **AZS**
Sulfide	1620	40.0		mg/Kg	133908	1	8/19/2010 12:25 PM

Qualifiers:

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N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
CHLORINATED PESTICIDES, TCL SW8081B					**(SW3580)**		Analyst: **KDD**
4,4´-DDD	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
4,4´-DDE	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
4,4´-DDT	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Aldrin	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
alpha-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
alpha-Chlordane	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
beta-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Chlordane	BRL	98		mg/Kg	133786	20	8/19/2010 2:01 PM
delta-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Dieldrin	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endosulfan I	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Endosulfan II	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endosulfan sulfate	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endrin	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endrin aldehyde	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
Endrin ketone	BRL	2.0		mg/Kg	133786	20	8/19/2010 2:01 PM
gamma-BHC	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
gamma-Chlordane	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Heptachlor	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Heptachlor epoxide	BRL	0.98		mg/Kg	133786	20	8/19/2010 2:01 PM
Methoxychlor	BRL	9.8		mg/Kg	133786	20	8/19/2010 2:01 PM
Toxaphene	BRL	98		mg/Kg	133786	20	8/19/2010 2:01 PM
Surr: Decachlorobiphenyl	83.8	30-150		%REC	133786	20	8/19/2010 2:01 PM
Surr: Tetrachloro-m-xylene	58.0	30-150		%REC	133786	20	8/19/2010 2:01 PM
POLYCHLORINATED BIPHENYLS SW8082A					**(SW3580)**		Analyst: **KDD**
Aroclor 1016	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1221	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1232	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1242	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1248	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1254	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Aroclor 1260	BRL	9.8		mg/Kg	133785	10	8/19/2010 12:48 PM
Surr: Decachlorobiphenyl	165	45.4-192		%REC	133785	10	8/19/2010 12:48 PM
Surr: Tetrachloro-m-xylene	93.2	40.3-187		%REC	133785	10	8/19/2010 12:48 PM
CHLORINATED HERBICIDES SW8151A					**(SW3580)**		Analyst: **AK**
2,4,5-T	BRL	2000		ug/Kg	133784	1	8/18/2010 7:52 PM
2,4,5-TP (Silvex)	BRL	2000		ug/Kg	133784	1	8/18/2010 7:52 PM
2,4-D	BRL	2000		ug/Kg	133784	1	8/18/2010 7:52 PM
Dinoseb	BRL	4900		ug/Kg	133784	1	8/18/2010 7:52 PM

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Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
CHLORINATED HERBICIDES SW8151A					**(SW3580)**		Analyst: **AK**
Surr: DCAA	86.8	20-127		%REC	133784	1	8/18/2010 7:52 PM
APPENDIX IX METALS SW6010C					**(SW3050B)**		Analyst: **TAA**
Antimony	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Arsenic	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Barium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Beryllium	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Cadmium	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Chromium	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Cobalt	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Copper	0.694	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Lead	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Nickel	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Selenium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Silver	BRL	0.497		mg/Kg	133760	1	8/18/2010 3:11 PM
Thallium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Tin	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
Vanadium	BRL	0.993		mg/Kg	133760	1	8/18/2010 3:11 PM
TOTAL MERCURY - WASTE SW7471B					**(SW7471)**		Analyst: **MP**
Mercury	BRL	0.100		mg/Kg	133666	1	8/17/2010 2:48 PM
APPENDIX IX-SEMIVOLATILE ORGANICS SW8270D					**(SW3550C)**		Analyst: **YH**
1,2,4,5-Tetrachlorobenzene	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
1,2,4-Trichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,2-Dichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,3-Dichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,3-Dinitrobenzene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
1,4-Dichlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1,4-Napthoquinone	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
1-Naphthylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
2,3,4,6-Tetrachlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4,5-Trichlorophenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4,6-Trichlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dichlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dimethylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dinitrophenol	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
2,4-Dinitrotoluene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,6-Dichlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2,6-Dinitrotoluene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Acetylaminofluorene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM

Qualifiers:

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H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
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Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX-SEMIVOLATILE ORGANICS	**SW8270D**				**(SW3550C)**		Analyst: **YH**
2-Chloronaphthalene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Chlorophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Methylnaphthalene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Methylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Naphthylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Nitroaniline	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Nitrophenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
2-Picoline	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
3,3´-Dichlorobenzidine	BRL	660		ug/Kg	133832	1	8/18/2010 6:56 PM
3,3´-Dimethylbenzidine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
3,4-Methylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
3-Methylcholanthrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
3-Nitroaniline	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4,6-Dinitro-2-methylphenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Aminobiphenyl	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Bromophenyl phenyl ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Chloro-3-methylphenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Chloroaniline	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Chlorophenyl phenyl ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Nitroaniline	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Nitrophenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
4-Nitroquinoline,1-oxide	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
5-Nitro-o-toluidine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
7,12-Dimethylbenz(a)anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
a,a-Dimethylphenethylamine	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Acenaphthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Acenaphthylene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Acetophenone	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Aniline	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Aramite	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benz(a)anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(a)pyrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(b)fluoranthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(g,h,i)perylene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzo(k)fluoranthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Benzyl alcohol	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Bis(2-chloroethoxy)methane	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Bis(2-chloroethyl)ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Bis(2-chloroisopropyl)ether	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM

Qualifiers:

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Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX-SEMIVOLATILE ORGANICS	**SW8270D**				**(SW3550C)**		Analyst: **YH**
Bis(2-ethylhexyl)phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Butyl benzyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Chlorobenzilate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Chrysene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Diallate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Dibenz(a,h)anthracene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Dibenzofuran	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Diethyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Dimethoate	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Dimethyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Di-n-butyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Di-n-octyl phthalate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Diphenylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Disulfoton	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Ethyl methanesulfonate	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Famphur	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Fluoranthene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Fluorene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorobenzene	BRL	9.9		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorobutadiene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorocyclopentadiene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachloroethane	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachlorophene	BRL	790		ug/Kg	133832	1	8/18/2010 6:56 PM
Hexachloropropene	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Indeno(1,2,3-cd)pyrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Isodrin	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Isophorone	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Isosafrole	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Kepone	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Methapyrilene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Methyl methanesulfonate	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Methyl parathion	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Naphthalene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Nitrobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodiethylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodimethylamine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitroso-di-n-butylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodi-n-propylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosodiphenylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosomethylethylamine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM

Qualifiers:				
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	BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
	H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
	N	Analyte not NELAC certified	NC	Not Confirmed
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Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX-SEMIVOLATILE ORGANICS	**SW8270D**				**(SW3550C)**		Analyst: **YH**
N-Nitrosomorpholine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosopiperidine	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
N-Nitrosopyrrolidine	BRL	400		ug/Kg	133832	1	8/18/2010 6:56 PM
O,O,O-Triethylphosphorothioate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
o-Toluidine	BRL	400		ug/Kg	133832	1	8/18/2010 6:56 PM
Parathion	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
p-Dimethylaminoazobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pentachlorobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pentachloronitrobenzene	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Pentachlorophenol	BRL	500		ug/Kg	133832	1	8/18/2010 6:56 PM
Phenacetin	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Phenanthrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Phenol	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Phorate	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
p-Phenylenediamine	BRL	5000		ug/Kg	133832	1	8/18/2010 6:56 PM
Pronamide	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pyrene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Pyridine	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Safrole	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Sym-Trinitrobenzene	BRL	99		ug/Kg	133832	1	8/18/2010 6:56 PM
Tetraethyl dithiopyrophosphate	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Thionazin	BRL	200		ug/Kg	133832	1	8/18/2010 6:56 PM
Surr: 2,4,6-Tribromophenol	115	44.1-135		%REC	133832	1	8/18/2010 6:56 PM
Surr: 2-Fluorobiphenyl	84.8	48.1-120		%REC	133832	1	8/18/2010 6:56 PM
Surr: 2-Fluorophenol	76.8	37.6-120		%REC	133832	1	8/18/2010 6:56 PM
Surr: 4-Terphenyl-d14	89.5	46-122		%REC	133832	1	8/18/2010 6:56 PM
Surr: Nitrobenzene-d5	114	39.1-120		%REC	133832	1	8/18/2010 6:56 PM
Surr: Phenol-d5	87.4	44-120		%REC	133832	1	8/18/2010 6:56 PM
APPENDIX IX VOLATILE ORGANICS	**SW8260B**				**(SW5030B)**		Analyst: **AR**
1,1,1,2-Tetrachloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1,1-Trichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1,2-Trichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1-Dichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,1-Dichloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2,3-Trichloropropane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dibromoethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dichlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT: Krevolin & Horst, LLC
Project: Apollo Industries
Lab ID: 1008B22-001

Client Sample ID: AI-08-10-WS-1
Collection Date: 8/13/2010 12:50:00 PM
Matrix: WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX VOLATILE ORGANICS SW8260B					**(SW5030B)**		Analyst: **AR**
1,2-Dichloroethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,2-Dichloropropane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,3-Dichlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,4-Dichlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
1,4-Dioxane	BRL	150		ug/L	133814	1	8/18/2010 7:32 PM
2-Butanone	BRL	50		ug/L	133814	1	8/18/2010 7:32 PM
2-Hexanone	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
4-Methyl-2-pentanone	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Acetone	BRL	50		ug/L	133814	1	8/18/2010 7:32 PM
Acetonitrile	BRL	100		ug/L	133814	1	8/18/2010 7:32 PM
Acrolein	BRL	20		ug/L	133814	1	8/18/2010 7:32 PM
Acrylonitrile	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Allyl Chloride	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Benzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Bromodichloromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Bromoform	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Bromomethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Carbon disulfide	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Carbon tetrachloride	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Chlorobenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Chloroethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Chloroform	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Chloromethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Chloroprene	BRL	20		ug/L	133814	1	8/18/2010 7:32 PM
cis-1,3-Dichloropropene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Dibromochloromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Dibromomethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Dichlorodifluoromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Ethyl Methacrylate	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Ethylbenzene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Iodomethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Isobutyl Alcohol	BRL	200		ug/L	133814	1	8/18/2010 7:32 PM
Methyl Methacrylate	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Methylacrylonitrile	BRL	200		ug/L	133814	1	8/18/2010 7:32 PM
Methylene chloride	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Naphthalene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Pentachloroethane	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Propionitrile	BRL	100		ug/L	133814	1	8/18/2010 7:32 PM
Styrene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Tetrachloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
APPENDIX IX VOLATILE ORGANICS SW8260B					**(SW5030B)**		Analyst: **AR**
Toluene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
trans-1,2-Dichloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
trans-1,3-Dichloropropene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
trans-1,4-Dichloro-2-butene	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Trichloroethene	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Trichlorofluoromethane	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Vinyl acetate	BRL	10		ug/L	133814	1	8/18/2010 7:32 PM
Vinyl chloride	BRL	2.0		ug/L	133814	1	8/18/2010 7:32 PM
Xylenes, Total	BRL	5.0		ug/L	133814	1	8/18/2010 7:32 PM
Surr: 4-Bromofluorobenzene	96.1	60.1-127		%REC	133814	1	8/18/2010 7:32 PM
Surr: Dibromofluoromethane	102	79.6-126		%REC	133814	1	8/18/2010 7:32 PM
Surr: Toluene-d8	98.2	78-116		%REC	133814	1	8/18/2010 7:32 PM
VOLATILE ORGANIC COMPOUNDS BY GC/MS SW8260B					**(SW5035)**		Analyst: **AR**
1,4-Dioxane	BRL	5000000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acetonitrile	BRL	3300000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Allyl Chloride	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloroprene	BRL	670000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Ethyl Methacrylate	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Isobutyl Alcohol	BRL	6700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Methyl Methacrylate	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Methylacrylonitrile	BRL	6700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Pentachloroethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Propionitrile	BRL	3300000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Dichlorodifluoromethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloromethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Vinyl chloride	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Bromomethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloroethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Trichlorofluoromethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acrolein	BRL	670000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1-Dichloroethene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acetone	BRL	3300000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Iodomethane	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Carbon disulfide	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Vinyl acetate	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Methylene chloride	BRL	1700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Acrylonitrile	370000	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
trans-1,2-Dichloroethene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1-Dichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/MS SW8260B					**(SW5035)**		Analyst: **AR**
2-Butanone	BRL	1700000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chloroform	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,1-Trichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Carbon tetrachloride	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Benzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Trichloroethene	19000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
1,2-Dichloropropane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Dibromomethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Bromodichloromethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
cis-1,3-Dichloropropene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
4-Methyl-2-pentanone	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Toluene	23000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
trans-1,3-Dichloropropene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,2-Trichloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
2-Hexanone	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Tetrachloroethene	26000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
Dibromochloromethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dibromoethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Chlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,1,2-Tetrachloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Ethylbenzene	3900000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
Styrene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Bromoform	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,1,2,2-Tetrachloroethane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2,3-Trichloropropane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
trans-1,4-Dichloro-2-butene	BRL	330000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,3-Dichlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,4-Dichlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dichlorobenzene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
1,2-Dibromo-3-chloropropane	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Naphthalene	BRL	170000		ug/Kg	133658	5000	8/18/2010 10:12 PM
Xylenes, Total	13000000	1700000		ug/Kg	133658	50000	8/19/2010 2:04 PM
Surr: 4-Bromofluorobenzene	97.0	58.2-140		%REC	133658	50000	8/19/2010 2:04 PM
Surr: 4-Bromofluorobenzene	102	58.2-140		%REC	133658	5000	8/18/2010 10:12 PM
Surr: Dibromofluoromethane	103	71.1-132		%REC	133658	50000	8/19/2010 2:04 PM
Surr: Dibromofluoromethane	98.8	71.1-132		%REC	133658	5000	8/18/2010 10:12 PM
Surr: Toluene-d8	99.2	77.6-119		%REC	133658	50000	8/19/2010 2:04 PM
Surr: Toluene-d8	99.1	77.6-119		%REC	133658	5000	8/18/2010 10:12 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

Analytical Environmental Services, Inc.

Date: *19-Aug-10*

CLIENT:	Krevolin & Horst, LLC	**Client Sample ID:**	AI-08-10-WS-1
Project:	Apollo Industries	**Collection Date:**	8/13/2010 12:50:00 PM
Lab ID:	1008B22-001	**Matrix:**	WASTE

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed
CYANIDE, TOTAL SW9014					**(SW9010)**		Analyst: **CG**
Cyanide, Total	BRL	0.990		mg/Kg	133868	1	8/18/2010 2:35 PM
SULFIDE BY SW9030/9034					**(SW9030)**		Analyst: **AZS**
Sulfide	1620	40.0		mg/Kg	133908	1	8/19/2010 12:25 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Estimated (Value above quantitation range)
BRL	Below Reporting Limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See Case Narrative
N	Analyte not NELAC certified	NC	Not Confirmed
B	Analyte detected in the associated Method Blank	<	Less than Result value
>	Greater than Result value		

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

AES

May 15, 2012

Javeed Sved
Apollo Industries, Inc.
1850 S. Cobb Ind. Blvd.
Smyrna GA 30082

TEL: (770) 433-0210
FAX: (770) 436-7643

RE: Wastewater/Apollo

Dear Javeed Syed: Order No: 1205679

Analytical Environmental Services, Inc. received 1 samples on 5/8/2012 12:26:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.

AES' certifications are as follows:

-NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water Microbiology, effective 07/01/11-06/30/12.

-AIHA Certification ID #100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) effective until 09/01/13.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Mirzeta Kararic

Mirzeta Kararic
Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3785 Presidential Parkway, Atlanta GA 30340-3704
AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1205679

Date: 5/8/12 Page 1 of 1

COMPANY: Apollo Technologies
ADDRESS: 1850 S. Cobb Ind. BLVD. Smyrna, GA. 30082
PHONE: 770-433-0210
FAX: 770-436-7643
SAMPLED BY:
SIGNATURE: JM.

ANALYSIS REQUESTED: HCl, 8260B

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	HCl	8260B	REMARKS	No # of Containers
1	Hazardous Waste	5/8/12	8:30 AM	X			X	X	P.H 9.0	
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										

PRESERVATION (See codes)

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Javeed Syed JM.	5/8/12 8:30 AM	1: [signature]	5-8-12 12:02
2: [signature]	5-8-12 12:26	2: [signature]	5/8/12 12:26
3:		3:	

PROJECT INFORMATION
PROJECT NAME:
PROJECT #:
SITE ADDRESS:
SEND REPORT TO:
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #: PO#:

RECEIPT
Total # of Containers

Turnaround Time Request
- ● Standard 5 Business Days
- ○ 2 Business Day Rush
- ○ Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other

STATE PROGRAM (if any):
E-mail? Y / N, Fax? Y / N
DATA PACKAGE: I II III IV

SPECIAL INSTRUCTIONS/COMMENTS: Haz waste sample to check total VOC using 8260B METHOD. Check for calprint 35

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water
PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client:	Apollo Industries, Inc.
Project:	Wastewater/Apollo
Lab ID:	1205679

Case Narrative

Sample Receiving Nonconformance:

Vials for sample were received with headspace present as signified by >1/4 inch bubble present. Proceed with analysis per project history.

Volatile Organic Compounds Analysis by Method 8260B:

Due to sample matrix, sample 1205679-001 required dilution during preparation and/or analysis resulting in elevated reporting limits.

Product ID:

Method 8015C chromatographic information for sample 1205679-001B indicates a pattern present that is consistent with the client supplied product Calprint 35. The estimated concentration of CALPRINT 35 is reported as DRO.

Analytical Environmental Services, Inc

Date: 15-May-12

Client:	Apollo Industries, Inc.	**Client Sample ID:**	HAZARDOUS WASTE
Project Name:	Wastewater/Apollo	**Collection Date:**	5/8/2012 8:30:00 AM
Lab ID:	1205679-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,1,2,2-Tetrachloroethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,1,2-Trichloroethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,1-Dichloroethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,1-Dichloroethene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,2,4-Trichlorobenzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,2-Dibromo-3-chloropropane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,2-Dibromoethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,2-Dichlorobenzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,2-Dichloroethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,2-Dichloropropane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,3-Dichlorobenzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
1,4-Dichlorobenzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
2-Butanone	BRL	250000		ug/L	161355	5000	05/12/2012 06:36	NP
2-Hexanone	BRL	50000		ug/L	161355	5000	05/12/2012 06:36	NP
4-Methyl-2-pentanone	BRL	50000		ug/L	161355	5000	05/12/2012 06:36	NP
Acetone	130000000	25000000		ug/L	161355	500000	05/14/2012 11:56	NP
Benzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Bromodichloromethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Bromoform	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Bromomethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Carbon disulfide	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Carbon tetrachloride	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Chlorobenzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Chloroethane	BRL	50000		ug/L	161355	5000	05/12/2012 06:36	NP
Chloroform	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Chloromethane	BRL	50000		ug/L	161355	5000	05/12/2012 06:36	NP
cis-1,2-Dichloroethene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
cis-1,3-Dichloropropene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Cyclohexane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Dibromochloromethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Dichlorodifluoromethane	BRL	50000		ug/L	161355	5000	05/12/2012 06:36	NP
Ethylbenzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Freon-113	BRL	50000		ug/L	161355	5000	05/12/2012 06:36	NP
Isopropylbenzene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
m,p-Xylene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Methyl acetate	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Methyl tert-butyl ether	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Methylcyclohexane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Methylene chloride	58000	25000		ug/L	161355	5000	05/12/2012 06:36	NP
o-Xylene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 15-May-12

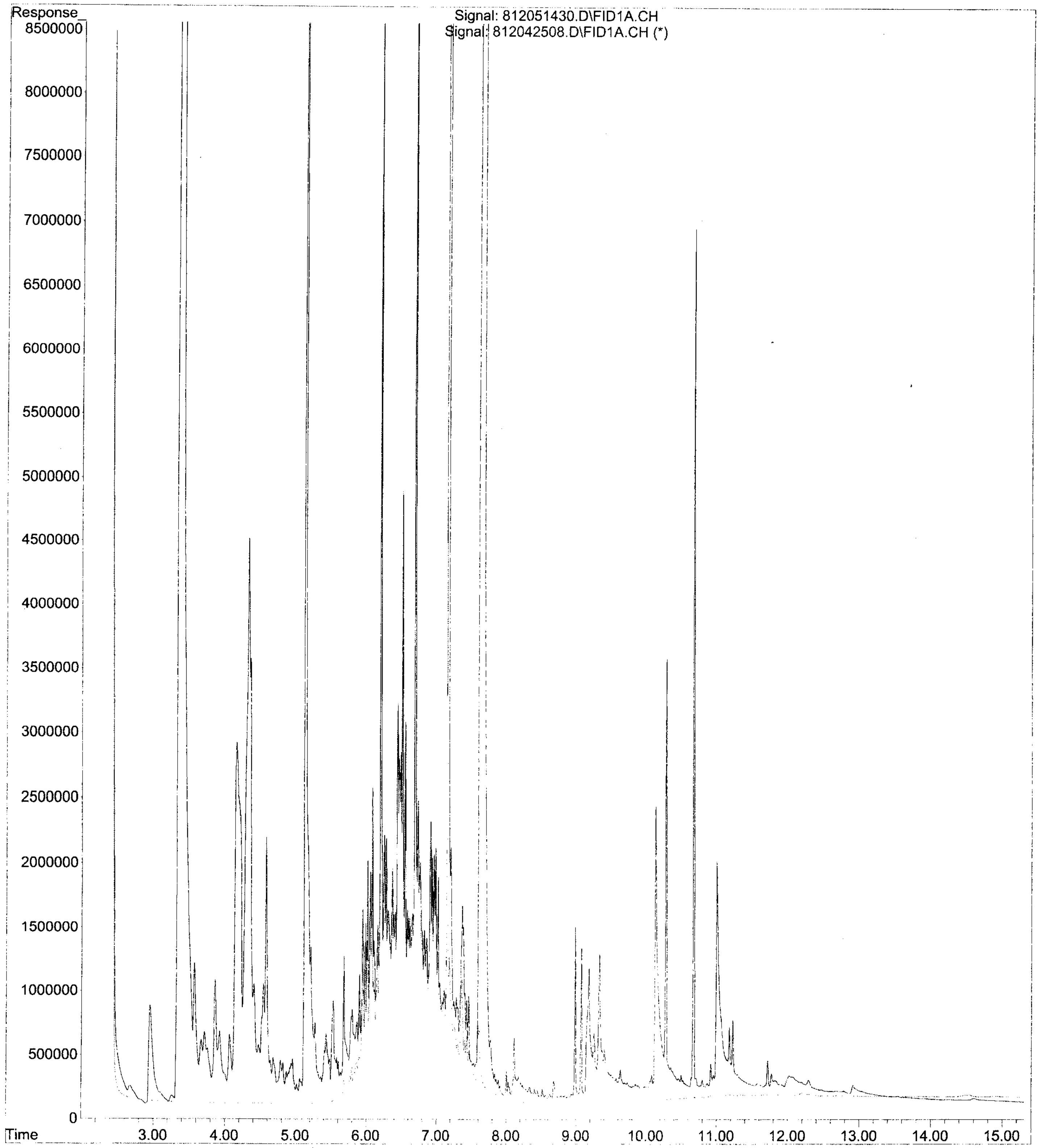
Client:	Apollo Industries, Inc.	**Client Sample ID:**	HAZARDOUS WASTE
Project Name:	Wastewater/Apollo	**Collection Date:**	5/8/2012 8:30:00 AM
Lab ID:	1205679-001	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Tetrachloroethene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Toluene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
trans-1,2-Dichloroethene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
trans-1,3-Dichloropropene	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Trichloroethene	73000	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Trichlorofluoromethane	BRL	25000		ug/L	161355	5000	05/12/2012 06:36	NP
Vinyl chloride	BRL	10000		ug/L	161355	5000	05/12/2012 06:36	NP
Surr: 4-Bromofluorobenzene	95.4	67.4-123		%REC	161355	5000	05/12/2012 06:36	NP
Surr: 4-Bromofluorobenzene	95.3	67.4-123		%REC	161355	500000	05/14/2012 11:56	NP
Surr: Dibromofluoromethane	110	75.5-128		%REC	161355	500000	05/14/2012 11:56	NP
Surr: Dibromofluoromethane	106	75.5-128		%REC	161355	5000	05/12/2012 06:36	NP
Surr: Toluene-d8	92.9	70-120		%REC	161355	500000	05/14/2012 11:56	NP
Surr: Toluene-d8	88.1	70-120		%REC	161355	5000	05/12/2012 06:36	NP
DIESEL RANGE ORGANICS SW8015C				**(SW3580)**				
TPH (Diesel Range Organics)	34000	2000		mg/Kg	161387	1	05/14/2012 21:43	SN
Surr: Dioctylphthalate	196	54.1-169	S	%REC	161387	1	05/14/2012 21:43	SN

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

```
File          :C:\msdchem\1\data\120514\812051430.D
Operator      : SLN
Acquired      : 14 May 2012   9:43 pm using AcqMethod DRO1.M
Instrument :    HP G1530A
Sample Name: 1205679-001B
Misc Info    : SAMP DRO_X
Vial Number: 27
```



Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client Apollo Tech   Work Order Number 1205679

Checklist completed by [signature] (Signature)   05/09/2012 (Date)

Carrier name: FedEx __ UPS __ Courier ✓ Client __ US Mail __ Other ______

Shipping container/cooler in good condition? Yes ✓ No __ Not Present __

Custody seals intact on shipping container/cooler? Yes ✓ No __ Not Present __

Custody seals intact on sample bottles? Yes ✓ No __ Not Present __

Container/Temp Blank temperature in compliance? (4°C±2)* Yes ✓ No __

Cooler #1 3.9 Cooler #2 ______ Cooler #3 ______ Cooler #4 ______ Cooler#5 ______ Cooler #6 ______

Chain of custody present? Yes ✓ No __

Chain of custody signed when relinquished and received? Yes ✓ No __

Chain of custody agrees with sample labels? Yes ✓ No __

Samples in proper container/bottle? Yes ✓ No __

Sample containers intact? Yes ✓ No __

Sufficient sample volume for indicated test? Yes ✓ No __

All samples received within holding time? Yes ✓ No __

Was TAT marked on the COC? Yes ✓ No __

Proceed with Standard TAT as per project history? Yes __ No __ Not Applicable ✓

Water - VOA vials have zero headspace? No VOA vials submitted __ Yes __ No ✓

Water - pH acceptable upon receipt? Yes ✓ No __ Not Applicable __

Adjusted? ____________ Checked by ____________

Sample Condition: Good ✓ Other(Explain) ____________

(For diffusive samples or AIHA lead) Is a known blank included? Yes __ No ✓

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\L\Quality Assurance\Checklists Procedures Sign-Off Templates\Checklists\Sample Receipt Checklists\Sample_Cooler_Receipt_Checklist

ATTACHMENT 2

Prepared for:
Apollo Technologies, Inc.
1850 South Cobb Industrial Boulevard
Smyrna, Georgia 30082

ASSESSMENT REPORT

WASTE TANK ST45 AND PIPING SYSTEM

Prepared by:
Resolve Environmental Engineering, Inc.
1444 Waterford Green Drive
Marietta, Georgia 30068

July 2012 Inspections

RESOLVE
Environmental Engineering

August 6, 2012

Apollo Technologies, Inc.
1850 South Cobb Industrial Boulevard
Smyrna, Georgia 30082

Attention: Mr. Javeed Syed

Subject: **Assessment Report for Waste Tank ST45 and Piping System Leak Detection**
Smyrna Facility, Georgia
Resolve Project # 272-50-1

Dear Mr. Syed:

Resolve Environmental Engineering, Inc. (Resolve) performed a Formal External Inspection of the Waste Tank ST45 aboveground storage tank (AST) at the Apollo Technologies Inc. (Apollo) facility located in Smyrna, Georgia in July 2012. The inspection was performed in accordance with Steel Tank Institute (STI) standard SP001, *Standard for Inspection of Aboveground Storage Tanks*, Fifth Edition, September, 2011. Resolve also performed an inspection of the piping system which leads from the manufacturing facility to Waste Tank ST45. This Assessment Report documents the procedures, findings, and recommendations of these inspections, which satisfy the annual inspection requirements of 40 CFR 264 (Subpart BB and Subpart CC).

Resolve appreciates this opportunity to provide you with these professional services. If you have any questions regarding the report or the project in general, please don't hesitate to give us a call at 770-650-9990.

Sincerely,
Resolve Environmental Engineering, Inc.

Ian Lundberg, PE
Principal Engineer

1444 Waterford Green Drive Marietta Georgia 30068-2525 p 770-650-9990 f 770-650-9991

EXECUTIVE SUMMARY

In accordance with the annual inspection requirements for hazardous waste large quantity generators (LQG) facilities of Title 40 Code of Federal Regulations (40 CFR) 264 (including Subpart BB and Subpart CC), and the oil pollution prevention rules of 40 CFR 112.8(c)(6), Apollo conducts periodic integrity testing of storage tanks and piping system at their facility in Smyrna, Georgia. Resolve Environmental Engineering, Inc. (Resolve) performed an STI SP001 formal external inspection on the 7,400 gallon Waste Tank ST45 and a Method 21 leak detection inspection on the Waste Tank ST45 piping system in July 2012.

Resolve classifies observations of the inspected tanks and associated systems as follows:

- deficiency currently posing a risk for loss of tank integrity
- deficiency with regard to an associated standard; and
- condition that could reduce tank life, increase the potential for a release, and/or impair safety conditions.

As documented in this Assessment Report, Resolve has determined that there are **no deficiencies currently posing a risk for loss** of tank integrity and that this tank is **suitable for service as a storage container** in accordance with the STI inspection standard and the Oil Pollution Prevention rules. Additionally, the secondary containment system is adequate to contain the entire volume of the largest tank.

Resolve did observe one condition that represents a deficiency with regard to an associated standard and could impair safety or result in citation under rules other than the Oil Pollution Prevention rules. Specifically, UL 142 Table 8.2 requires a minimum normal vent size of two inches. On this tank, the normal vent piping reduces from two inches to one inch, thereby reducing the normal venting capacity below UL 142 standards. In addition, **UL 142 Section 8.2 requires the normal vent to be at least as large as the largest fill or withdrawal line.** The tank fill/withdrawal line is three-inch diameter.

Resolve also observed one condition that does not need to be addressed from a fitness for service standpoint and does not currently pose a risk for loss of tank integrity, but may be addressed at the client's discretion in order to optimize tank life, minimize the potential for a release, and/or enhance safety conditions. Specifically, **Resolve noted there was some minor coating failure on the lower 6 inches of Waste Tank ST45.** This coating failure was due to rainfall which collected inside the secondary containment. It was noted that the potential for future storm water accumulation had been eliminated with an installed cover over the secondary containment.

To address these issues, Resolve recommends:

(1) the normal vent piping be increased to match the fill/withdrawal line diameter; and
(2) the lower portion of the tank be sanded, primed, and re-coated.

In addition to the tank inspection, Resolve performed an inspection of the piping system including all valves, threaded connectors, elbows, unions, backflow preventers, and other piping system devices in accordance with USEPA Method 21. A Method 21 inspection utilizes an organic vapor detector (i.e., photoionization detector (PID)) to evaluate piping system devices for leaks. In accordance with Method 21, an instrument reading of greater than 10,000 parts per million (ppm) is considered a leak. Resolve did not identify any leaks in the Waste Tank ST45 piping system.

In accordance with Resource Conservation and Recovery Act (RCRA) guidelines for Apollo, Resolve recommends the next formal inspection for this tank and piping system be conducted in July 2013.

REPORT CERTIFICATIONS

Mr. Ian Lundberg, PE, a qualified Professional Engineer, hereby certifies that the inspections documented in this report fully meet the annual inspection and integrity testing requirements of 40 CFR 264 (including Subpart BB and Subpart CC) for the 7,400 gallon vertical Waste Tank at the Apollo facility in Smyrna, Georgia. This assessment has determined that the tank system is adequately designed and has sufficient structural strength and compatibility with the liquids stored to ensure that it will not collapse, rupture, or fail. This assessment has also determined that there are not any identifiable leaks in the piping system components.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

P.E. Signature: ______________________ Seal: GEORGIA REGISTERED No. 22139 PROFESSIONAL ENGINEER IAN G. LUNDBERG

P.E. Name: Ian Lundberg

Date: August 6, 2012

Registration #: 22139

State: Georgia

Resolve Environmental Engineering, Inc., hereby certifies that the Formal External Inspection of the listed aboveground storage tank was conducted in accordance with the Steel Tank Institute (STI) standard SP001, *Standard for Inspection of Aboveground Storage Tanks* (Fifth Edition, September 2011).

STI/API Certified Tank Inspector Signature: ______________________

STI/API Certified Tank Inspector Name: Steven L. Shugart

STI Registration #: AST 212-06

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1.0 INTRODUCTION

1.1 Statement of Purpose

The Apollo Technologies Inc. (Apollo) facility in Smyrna, Georgia is subject to the Resource Conservation and Recovery Act (RCRA) Title 40 Code of Federal Regulations (40 CFR) Part 264.191 *Assessment of tank system integrity* and Subpart BB *Air Emission Standards for Equipment Leaks,* and Subpart CC *Air Emission Standards for Tanks, Surface Impoundments, and Containers*. In accordance with the RCRA rules, the facility is required to conduct periodic tank integrity testing and piping system leak detection to determine whether the systems are adequately designed and have sufficient structural strength and compatibility with the waste to be stored or treated, to ensure that the tank will not collapse, rupture, or fail, or that piping system components will not leak. Waste Tank ST45, a 7,400 gallon vertical, steel, single-wall tank storing solvent waste and the piping system are subject to these assessment requirements.

In addition, the facility is subject to the Oil Pollution Program (OPP) rules because oil products greater than 1,320 gallons are stored in the ASTs. The national Oil Spill Prevention, Control, and Countermeasures (SPCC) program was implemented January 10, 1974, under the authority of the 1970 Federal Water Pollution Control Act (Act). The Act requires facilities to develop and implement plans for preventing, controlling, and responding to oil and fuel spills. Under the OPP rules, all facilities that at times may store oil in quantities greater than 1,320 gallons in aboveground storage tanks (ASTs), or 42,000 gallons in underground storage tanks (USTs) that are not regulated under Title 40 Code of Federal Regulations Part 280 (40 *CFR* 280), must prepare an SPCC Plan. 40 CFR 112.8(c)(6) requires periodic integrity testing of all tanks 55 gallons and larger.

The purpose of this inspection at the Apollo facility was to meet RCRA and OPP rule and regulation inspection requirements. The purpose of this Assessment Report (AR) is to document the recently conducted tank and piping system inspections.

1.2 Background

Apollo has operated a regional facility located at 1850 South Cobb Industrial Boulevard in Smyrna, Georgia for the past 38 years. At this regional facility, Apollo manufactures specialty aerosol products and liquid chemical products. In the past, the Apollo line of products has grown to include over 250 products such as cleaners, disinfectants, deodorants, insecticides, kitchen products, automotive and industrial aerosols to offer to distributors and wholesalers worldwide. Apollo also serves as a contract packager and custom filler.

The Apollo property is situated on the south side of South Cobb Industrial Drive and consists of three separate buildings including a manufacturing building, warehouse, and miscellaneous structures. The manufacturing facility has two tank farms on the west side of the main building; the tank farm with Waste Tank ST45 has four vertical steel tanks. The four ASTs are each approximately 7,400 gallons. The tank inspection was conducted by Mr. Steven L. Shugart of Resolve in July 2012.

1.3 Report Contents

In addition to the Introduction Section, the remainder of this report contains the following information:

- a description of applicable tank inspection standards;
- inspection observations; and
- suitability for service, recommendations, and the next inspection interval.

2.0 TANK INSPECTION STANDARDS AND PERSONNEL QUALIFICATIONS

To meet the requirements of 40 CFR 264.191, facilities must test ASTs for integrity to determine whether the tank system is adequately designed, and has sufficient structural strength and compatibility with the waste to be stored or treated, to ensure that it will not collapse, rupture, or fail. Additionally, to meet the requirements of 40 CFR 112.8(c)(6), an SPCC Plan generally states that the subject facility will test ASTs for integrity on a regular schedule, as long as the tanks are in service, and whenever material repairs are made.

Waste Tank ST45 is a shop-built, welded, carbon steel AST. Waste solvents are stored at ambient pressure and temperatures. Accordingly, this tank meets the acceptance criteria for inspection under Steel Tank Institute (STI) Standard SP001, *Standard for Inspection of Aboveground Storage Tanks* (Fifth Edition, September 2011). The types and frequencies of integrity tests for the AST assessed in this report were selected in accordance with SP001.

The AST is situated within concrete containment such that through-bottom leaks will be detectable and is considered low risk (Category 1). The STI standard requires that Category 1 tanks between 5,000 and 50,000 gallons in capacity have a monthly visual inspection and a formal external inspection at least once every 20 years. The formal external inspection must be conducted in accordance with STI SP001 Section 7 by an STI Certified AST Inspector.

Resolve performed a formal external inspection on Waste Tank ST45 at the Smyrna facility in July 2012, as described in this report, thereby satisfying the formal external inspection requirements of 40 CFR 264.191 and the SPCC Plan for this tank. The inspection was performed by certified tank inspector Mr. Steven L. Shugart (STI Certified Tank Inspector No. AST R11167). Ultrasonic thickness measurements were collected using an Olympus Panametrics DL37Plus by Mr. Shugart, who was trained by a Panametrics representative and certified to be competent in the operation, calibration and set-up of the unit. Inspector certifications are included in Appendix E.

In addition to the tank inspection, Resolve performed a leak detection inspection on the Waste Tank ST45 piping system in accordance with USEPA Method 21, *Determination of Volatile Organic Compound Leaks*. Leak detection readings were collected with a MiniRae 3000 volatile organic compound (VOC) analyzer with a photoionization detector (PID) with a range from 0 to

15,000 ppm. An instrument calibration was performed on the MiniRae 3000 prior to beginning the pipe system readings. PID readings and system findings are presented in Section 3 of this Assessment Report.

3.0 TANK INSPECTION OBSERVATIONS

3.1 Waste Tank ST45 Inspection

Waste Tank ST45 is a 7,400-gallon vertical, steel, single-wall, aboveground tank. The tank is approximately 8 feet in diameter and is 20 feet tall. It is located inside secondary containment in one of the facility tank farms on the west side of the property. Three other vertical steel tanks are located inside the secondary containment. The tank is setting on a concrete slab foundation and sits on a steel tank bottom; it is surrounded by a concrete wall. Figure 1 in Appendix A shows the dimensions of the tank. The following observations were noted regarding the tank:

- tank is shop fabricated, made of carbon steel with an 18-inch manway on the side of the tank;
- tank manufacturer is Modern Welding Company in Augusta, Georgia; the tank was built under UL-specifications; serial number UL A-615819;
- tank foundation is concrete and does not show any evidence of settlement;
- tank secondary containment consists of concrete walls; the wall height is approximately 3.9 feet in height, and the secondary containment dimensions are 15 feet by 33 feet; this secondary containment empties into an adjacent secondary containment with the following dimensions: 15 feet by 26.25 feet by 4.1 feet; current secondary containment capacity available for this tank is greater than 14.000 gallons;
- a 1/8-inch ground wire system was observed to be in good condition, securely fastened and free of corrosion;
- tank is single-walled carbon steel in good condition;
- the tank loading pipes, and other pipes associated with this tank, appear to be well supported; tank nozzles are located on the tank shell (including the tank manway) and on the tank roof;
- tank has a 2-inch normal vent and an 8-inch emergency vent on the tank roof; however, the normal vent piping reduces down to a 1-inch pipe which goes through an 8-inch diameter carbon column (see photographs);
- the following types of openings (penetrations) were observed in the tank shell: (1) 3-inch fill and discharge product line; (2) 18-inch manway; and (3) 1-inch level indicator nozzles;

- the following types of openings (penetrations) were observed in the tank roof: (1) 2-inch normal vent with 1-inch piping; (2) 18-inch manway; (3) 8-inch emergency vent; and (4) additional miscellaneous nozzles;
- 30 non-destructive UT measurements were made on the tank shell with a Panametrics DL37 Plus gauge (see Figure 1 for UT locations and Table 1 for UT measurements); the average thickness range for plates A, B, and C was 0.174 and 0.175 inches, respectively, and the minimum individual reading was 0.174 inches; the average remaining wall thickness exceeds current UL 142 design standards for new vertical steel tanks (0.167 inches shell thickness for the remaining tank); maximum metal loss was estimated to be 3.0% based upon an assumed initial shell thickness of 0.179 inches (Gage 7 carbon steel) for courses 1, 2, and 3; 50% metal loss is allowable before repairs are required, so no shell repairs are required;
- 5 non-destructive UT measurements were made on the exposed portion of the tank bottom with a Panametrics DL37 Plus gauge (see Figure 1 for UT locations and Table 1 for UT measurements); the average thickness for the bottom plate was 0.246 inches and the minimum individual reading was 0.244 inches; the average remaining bottom thickness exceeds current UL 142 design standards for new vertical steel tanks (0.240 inches bottom thickness for the remaining tank); maximum metal loss was estimated to be 2.4% based upon an assumed initial bottom thickness of 0.250 inches; 50% metal loss is allowable before repairs are required, so no shell repairs are required;
- 6 non-destructive UT measurements were made on the tank roof with a Panametrics DL37 Plus gauge (see Figure 1 for UT locations and Table 1 for UT measurements); the average thickness was 0.244 inches with the thinnest reading at 0.242 inches; the average remaining roof thickness exceeds current UL 142 design standards for new vertical steel tanks (0.123 inches roof thickness for the remaining tank); maximum metal loss was estimated to be 3.2% based upon an assumed initial roof thickness of 0.250 inches; 50% metal loss is allowable before repairs are required, so no roof repairs are required; and,
- minor coating failure was observed on the lower 6 inches of the tank shell.

Photographs are presented in Appendix C and copies of the Tank Inspection Field Data Collection Sheets are contained in Appendix D of this report. Inspection recommendations are contained in Section 4.2 of this report.

3.2 Piping System Inspection

The inspected piping system is a 3-inch and 2-inch diameter network that goes from Waste Tank ST45 to the manufacturing facility. Several other piping systems are co-located with the Waste Tank ST45 piping system from the inside of the manufacturing facility to the tank farms on the west side of the site. Figure 2 in Appendix A shows the layout of the piping system. The following observations were noted regarding the piping system:

- Line 1, nearest to the tank, is a 3-inch horizontal line 7 feet long with the following fittings: (1) 3-inch gate valve; (2) flange mounted flexible pipe; (3) Tee with reducer; (4) union; and (5) 90^0 elbow;
- Line 2 is a 2-inch horizontal and vertical line 8 feet long with the following fittings: (1) 45^0 backflow preventer; (2) 90^0 elbow; (3) 90^0 elbow; (4) reducer coupling to 1 inch pipe, valve, and cap; and (5) pneumatic emergency shutoff actuator;
- Line 3 is a 3-inch vertical line 4 feet long with the following fittings: (1) 90^0 elbow;
- Line 4 is a 3-inch horizontal line 5 feet long with the following fittings: (1) 90^0 elbow;
- Line 5 is a 3-inch vertical line 1.5 feet long with the following fittings: (1) 90^0 elbow;
- Line 6 is a 3-inch horizontal line 28.5 feet long with the following fittings: (1) threaded coupling; and (2) 3-inch Tee with 2-inch reducer insert;
- Line 7 is a 3-inch horizontal line 21 feet long, which reduces to a 2-inch line for 3.5 feet, then vertical for 2 feet, then horizontal for 3.5 feet with the following fittings: (1) reducer coupling; (2) 90^0 elbow; (3) 90^0 elbow; (4) union; and (5) butterfly valve with a hose connector;
- Line 8 is a 3-inch/2-inch vertical line 9 feet long with the following fittings: (1) valve; (2) union; and (3) 90^0 elbow;
- Line 9 is a 2-inch horizontal line 58 feet long with the following fittings: (1) 45^0 backflow preventer; (2) threaded coupling; (3) union; and (4) 90^0 elbow;
- Line 10 is a 2-inch horizontal line 34 feet long with the following fittings: (1) threaded coupling; and (2) 90^0 elbow;
- Line 11 is a horizontal line 22 feet long with the following fittings: (1) union; (2) threaded coupling; and (3) 90^0 elbow;
- Line 12 is a vertical line 6 feet long with the following fittings: (1) 90^0 elbow;
- Line 13 is a horizontal line 25 feet long with the following fittings: (1) threaded coupling; and (2) 90^0 elbow; and

- Line 14 is a horizontal and vertical line inside the manufacturing building with the following fittings: (1) four 90^0 elbows; and (2) butterfly valve with hose connector.

A layout of the piping system is presented in Appendix A. An instrument reading of greater than 10,000 parts per million (ppm) is considered a leak. Resolve did not observe any readings approaching 10,000 ppm.

4.0 SUITABILITY FOR SERVICE, RECOMMENDATIONS & NEXT INSPECTION

4.1 Suitability for Service

Resolve performed a formal external tank inspection on a vertical steel tank located at the Apollo facility in Smyrna, Georgia. Based on the external tank inspection, Waste Tank ST45 **is suitable for service** as a petroleum product storage container in accordance with the applicable criteria of STI SP001 (Fifth Edition, September 2011). In addition, the Waste Tank ST45 piping network from the manufacturing facility to the tank does not have any leaks (as defined in Method 21).

4.2 Recommendations

Resolve classifies observations of the inspected tank and associated systems as follows:

- deficiency currently posing a risk for loss of tank integrity
- deficiency with regard to an associated standard; and
- condition that could reduce tank life, increase the potential for a release, and/or impair safety conditions.

As documented in this Assessment Report, Resolve has determined that there are **no deficiencies currently posing a risk for loss** of tank integrity and that this tank **is suitable for service as a storage container** in accordance with the STI inspection standard and the Oil Pollution Prevention rules. Additionally, the secondary containment system is adequate to contain the entire volume of the largest tank.

Resolve did observe one condition that represents a deficiency with regard to an associated standard and could impair safety or result in citation under rules other than the Oil Pollution Prevention rules. Specifically, UL 142 Table 8.2 requires a minimum normal vent size of two inches. On this tank, the normal vent piping reduces from 2 inches to 1 inch, thereby reducing the normal venting capacity below UL 142 standards. In addition, UL 142 Section 8.2 requires the normal vent to be at least as large as the largest fill or withdrawal line. The tank fill/withdrawal line is three-inch diameter.

Resolve also observed one condition that do not need to be addressed from a fitness for service standpoint and do not currently pose a risk for loss of tank integrity, but may be addressed at the client's discretion in order to optimize tank life, minimize the potential for a release, and/or enhance safety conditions. Specifically, Resolve noted there was some minor coating failure on the lower 6 inches of Waste Tank ST45. This coating failure was due to rainfall which collected inside the secondary containment. It was noted that the potential for future storm water accumulation had been eliminated with an installed cover over the secondary containment.

To address these issues, Resolve recommends:

(3) the normal vent piping be increased to match the fill/withdrawal line diameter; and
(4) the lower portion of the tank be sanded, primed, and re-coated.

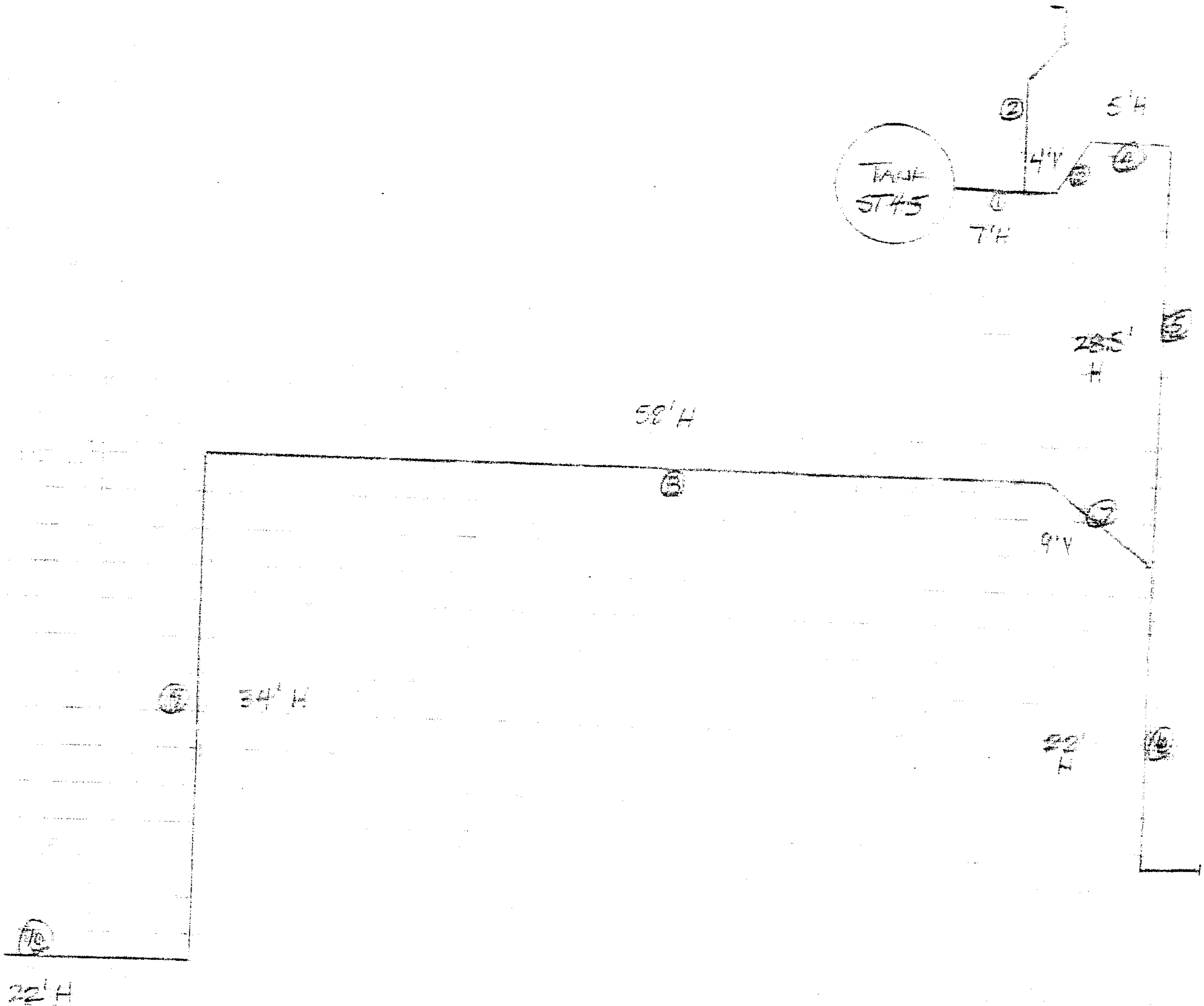
In addition to the tank inspection, Resolve performed a USEPA Method 21 inspection of the piping system including all valves, threaded connectors, unions, elbows, and other piping system fittings. A Method 21 inspection utilizes an organic vapor detector (i.e., photoionization detector (PID)) to evaluate piping system devices for leaks. An instrument reading of greater than 10,000 parts per million (ppm) is considered a leak. Resolve did not identify any leaks in the Waste Tank ST45 piping system.

4.3 Next Inspection

In accordance with RCRA requirements, Resolve recommends the next formal external inspection on Waste Tank ST45 be conducted in July 2013.

APPENDIX A

FIGURES



Ⓛ - Line Number

H - Horizontal

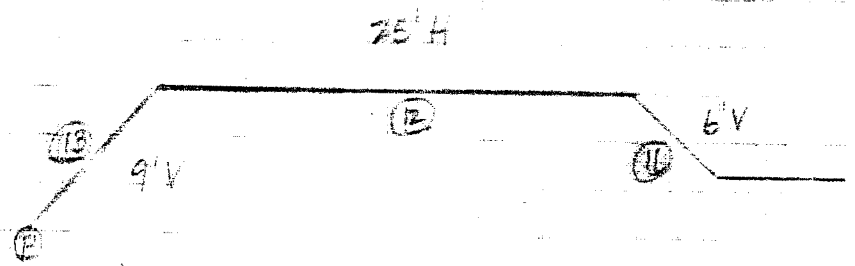
V - Vertical

WASTE TANK ST45 PIPING

APOLLO TECHNOLOGY

SMYRNA, GA

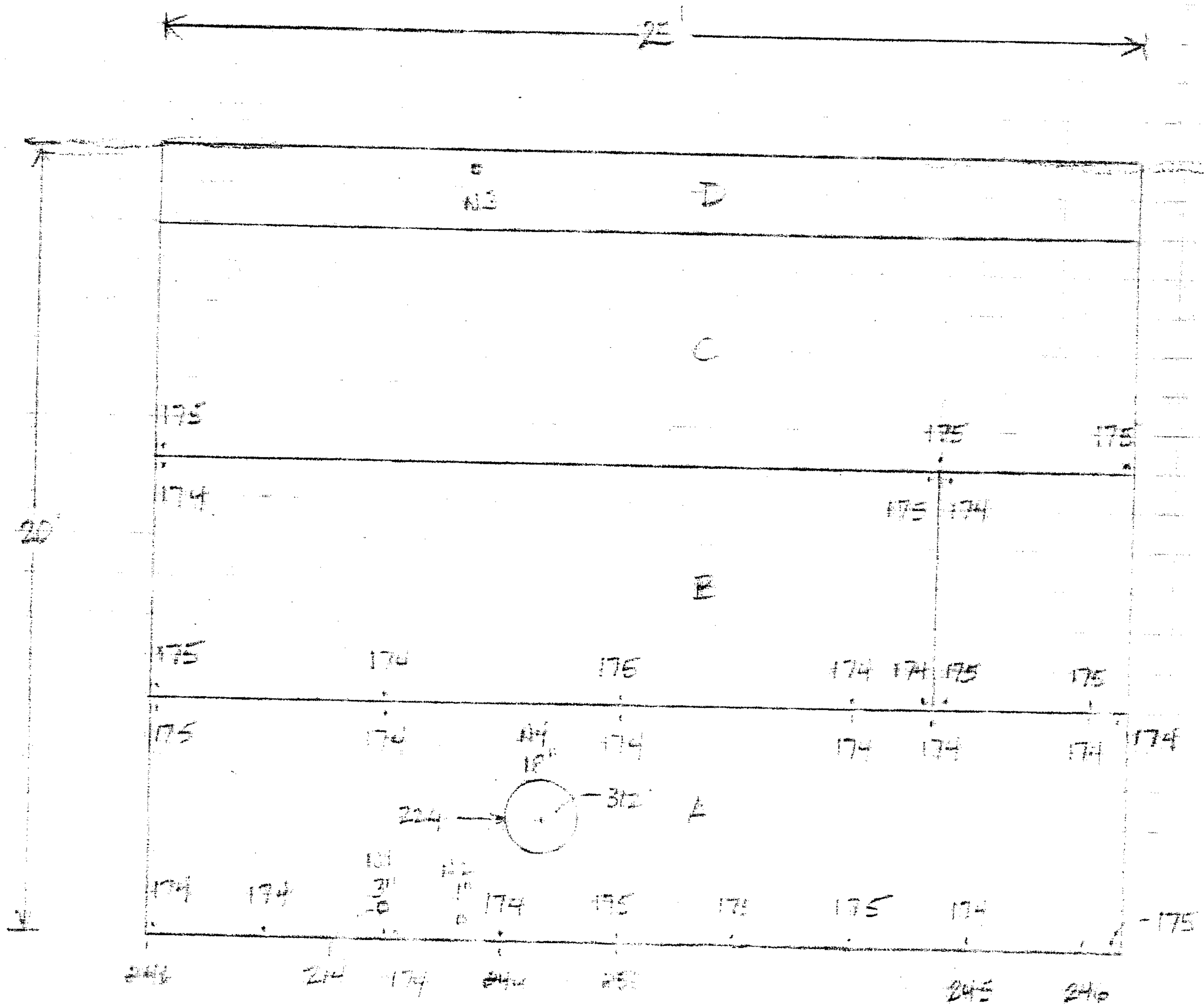
1" = 10'

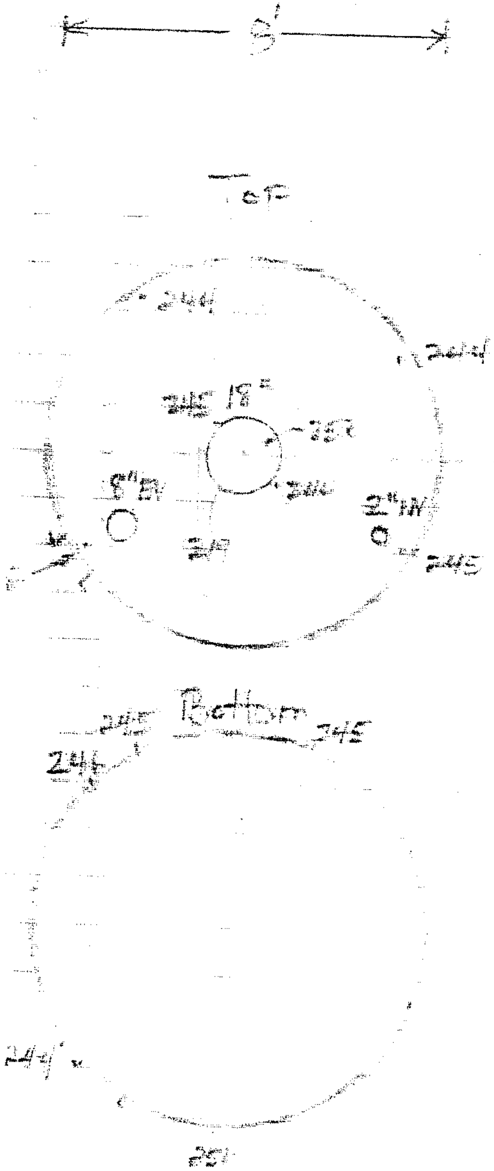


25' H
6' V
9' V

Nozzles:
N1 - 3" ϕ / discharge line
N2 - 1" level indicator
N3 - 1" " "
N4 - 18" manway

Issue:
(1) CF bottom 6" f
(2) Normal vent un





WASTE TANK S-45

APOLLO TECHNOLOGY

SMYRNA, GA

(1" = 2')

APPENDIX B

TABLES

Resolve Environmental Engineering, Inc. STI SP001 Ultrasonic Thickness Inspection
Apollo Technologies, Inc., Smyrna, Georgia

Waste Tank ST45 (7,400 gallons)

	Measurement Location				
	Plate A	Plate B	Plate C	Bottom	Roof
Measured Thickness (inches)	0.174	0.175	0.175	0.246	0.244
	0.174	0.174	0.175	0.244	0.244
	0.174	0.175	0.175	0.250	0.245
	0.174	0.174		0.245	0.242
	0.175	0.174		0.246	0.244
	0.175	0.175			0.245
	0.175	0.175			
	0.174	0.174			
	0.175	0.175			
	0.175	0.174			
	0.174				
	0.174				
	0.174				
	0.174				
	0.174				
	0.174				
	0.174				
Average	**0.174**	**0.175**	**0.175**	**0.246**	**0.244**
Minimum	**0.174**	**0.174**	**0.175**	**0.244**	**0.242**
Max. Variation	**0.001**	**0.001**	**0.000**	**0.004**	**0.002**
Original thickness [(a)]	0.179	0.179	0.179	0.250	0.250
Ave. % metal loss	**2.8%**	**2.7%**	**2.4%**	**1.5%**	**2.4%**
Max. % metal loss	**3.0%**	**3.0%**	**2.4%**	**2.4%**	**3.2%**

Notes:

(a) Assume nominal 0.179 inch (7 gauge) original shell and 0.25 inch roof and floor thickness.

(b) UT meter calibrations: measured 0.200 on 0.200" block; 0.500" on 0.500" thick block

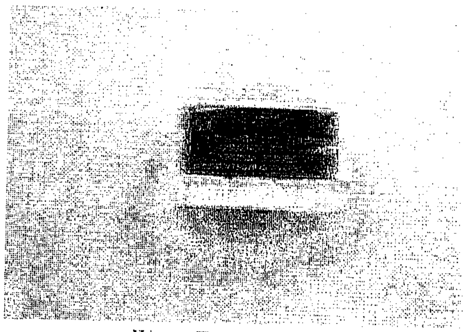
APPENDIX C

SITE PHOTOGRAPHS

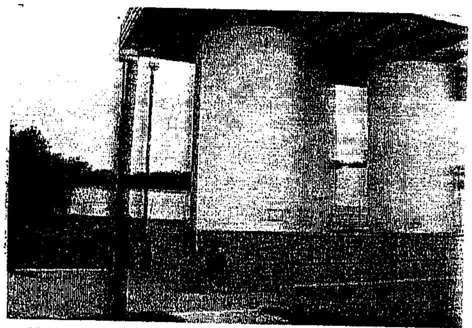
Resolve Environmental Engineering, Inc., External Tank Assessment Report

Apollo Technologies, Smyrna, Georgia

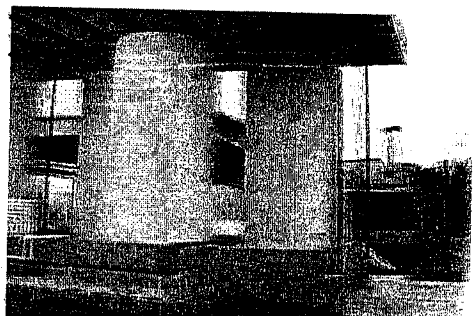
Appendix C: Photographs



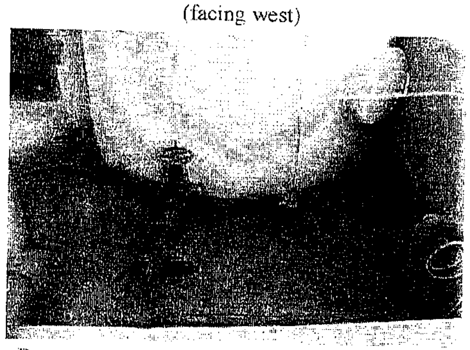
Waste Tank ST45 label



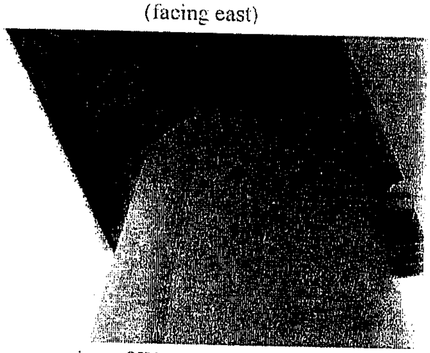
Waste Tank ST45 and secondary containment (facing west)



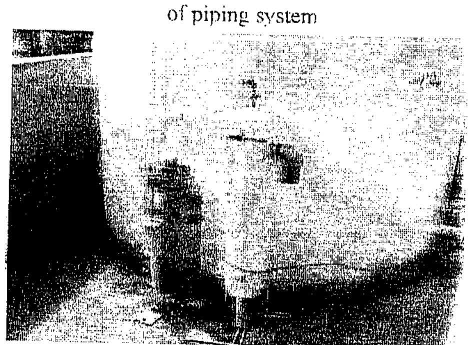
Waste Tank ST45 and portion of piping system (facing east)



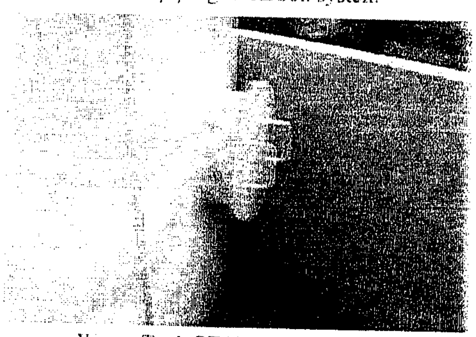
Bottom portion of Waste Tank ST45 and Line 1 of piping system



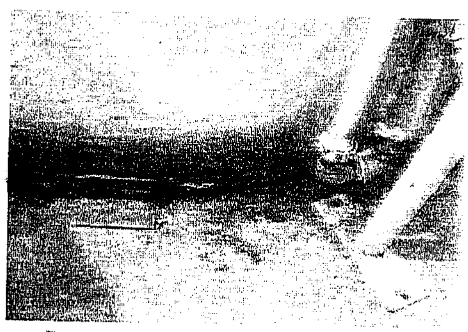
Upper portion of Waste Tank ST45 and normal vent piping to carbon system



Carbon filter installed by Apollo Technologies



Waste Tank ST45 18-inch manway



Bottom portion of Waste Tank ST45 with coating failure

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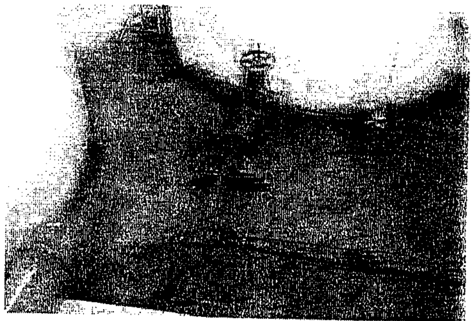
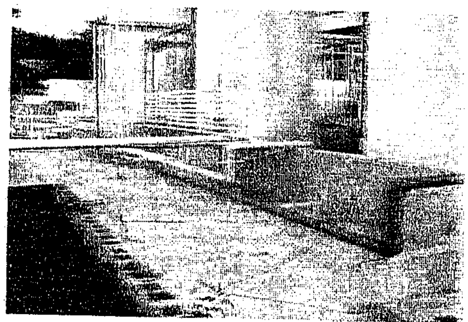
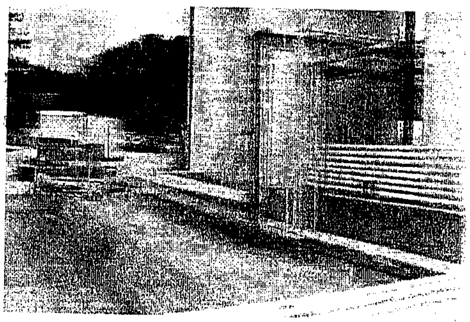
Appendix C: Photographs



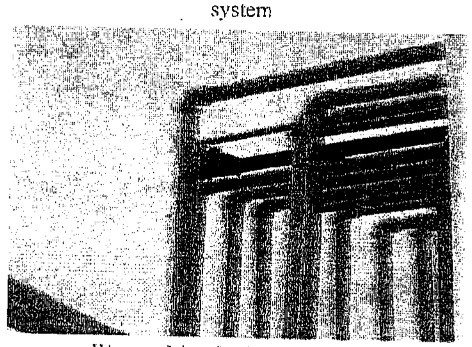
Line 1 and Line 2 of piping system



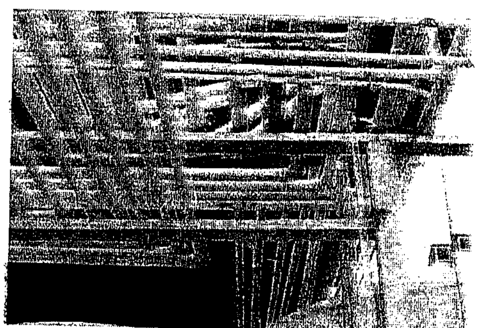
Line 4, Line 5, Line 6, and Line 7 of piping system



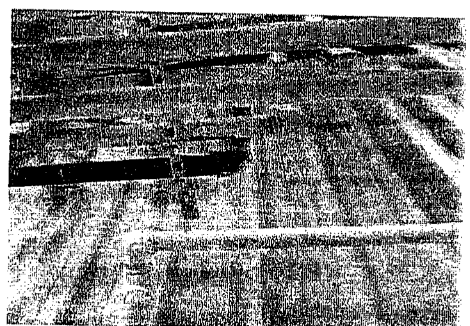
Line 8 and Line 9 of piping system



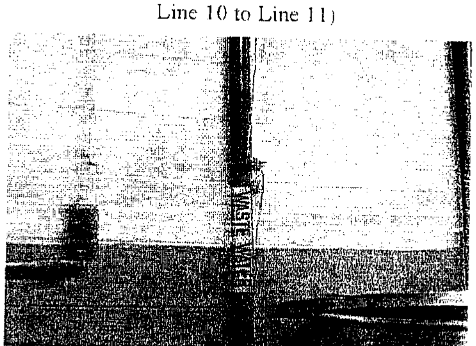
Wye on Line 9 of piping system



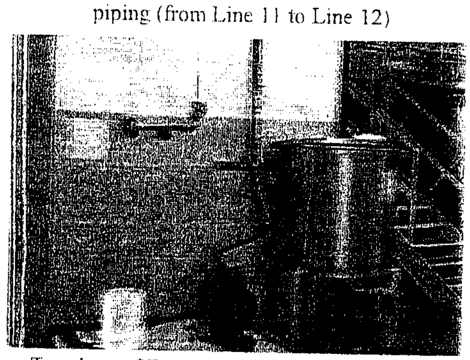
Typical elbow in piping system (transition from Line 10 to Line 11)



Transition elbow from horizontal to vertical piping (from Line 11 to Line 12)



Vertical piping inside manufacturing building above centrifugal pump



Terminus of Waste Tank ST45 piping system with centrifugal pump

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APPENDIX D

TANK INSPECTION FIELD DATA COLLECTION SHEETS

Resolve Environmental Engineering, Inc.

STI SP001 Formal External Tank Inspection Field Data Collection Sheet

Project Information

Tank name: Waste Tank ST45 Facility name: Apollo Technologies, Inc., Smyrna, GA Inspection date: 7/31/2012

Facility location: 1850 South Cobb Industrial Blvd., Smyrna, Georgia 30082

Inspector information

Inspector name(s): Steven Shugart SP001 Cert. No.: 212-06 UTT Cert. date: 8/27/2009 UTS Level: II

Tank description

Tank Capacity (gal): 7,400 Shell height (ft): 20 Diameter (ft): 8 Material stored: Solvent waste

Manufacturer: Modern Welding Company City, State: August, Georgia Phone: 706-722-3411

Tank type: ☑ Shop-built ☐ Field-erected Nameplate details: S.N. UL A-615819 Accurate? ☑

Dates: Construction: 6/25/1905 Installation: 6/25/1905 Last Inspection or Repair: Unknown

Design: ☑ UL 142 ☐ API ☐ Other: ☐ Insulated External coating:

Material of construction: ☑ Carbon steel ☐ Stainless steel ☐ Other:

Specific gravity: 1 Temperature: ☑ Ambient, or: °F SP001 applicable to tank? Yes (SG<1 and T<200 F)

Orientation: ☑ Vertical ☐ Horizontal ☐ Rectangular External coating type:

SP001 Category: ☑ Category 1 ☐ Category 2 ☐ Category 3

Containment & CRDM inspection

CRDM: ☑ Concrete ☐ Steel ☐ Elastomeric liner ☐ Elevated ☐ Other: ☐ None

Secondary containment dimensions: 15 x 33 x 3.9 Containment Capacity (gal): >14,000

Check boxes if any of the following are present and describe below:

☐ Penetrations ☐ Cracking ☐ Erosion ☐ Corrosion ☐ Foreign materials

☐ Changes from design ☐ Presence of liquid ☐ Presence of other tanks ☐ Drain valve(s) inoperable

Comments

Displacements: three other 8-foot diameter tanks; secondary containment empties into another secondary containment that is 15 ft x 26.25 ft by 4.1 ft. Containment and tank coating in very good condition.

Resolve Environmental Engineering, Inc.

STI SP001 Formal External Tank Inspection Field Data Collection Sheet

Project Information

Tank name: Waste Tank ST45 Facility name: Apollo Technologies, Inc., Smyrna, GA Inspection date: 7/31/2012

Foundation inspection (Check boxes if any of the following are present and describe at the bottom of sheet)

☐ Settlement ☐ Cracking ☐ Exposed rebar ☐ General disrepair ☐ Washout or voids
☐ Soil/sediment against shell ☐ Standing water contacting tank ☐ Washout or voids

Support inspection (Check boxes if any of the following are present and describe at the bottom of sheet)

☐ Cracking or spalling ☐ Coating failure ☐ Gap between tank or foundation ☐ Weld stress or deterioration

Piping inspection (Check boxes if any of the following are present and describe at the bottom of sheet)

☐ Leakage ☐ Stress/improper support ☐ Severe corrosion or degradation ☐ Coating failure

Fill line diameter (in): 3 Withdrawal line diameter (in): 3 Other appurtenances: ______

Vent inspection

Normal vent: Size (in): 1 Min. required (in): 3 Adequate? No ☑ Operable ☑ Good condition
Emergency vent: Size (in): 8 Min. required (in): 8 Adequate? Yes ☑ Operable ☑ Good condition

Gage inspection

Gage type: Sight gauge ☑ Properly sized ☐ Operates properly ☐ High level activates alarm

Grounding system inspection (either document inherent self-protection or inspect grounding system)

Criteria for inherent self-protection from lightning (NFPA 780 Section 7.4.1.1): ☐ All pipes metallically connected to tank
☐ Welded steel construction ☐ All vapor openings closed or have flame protection* ☐ Roof thickness ≥ 3/16"
*Opening closure is only required if contents may yield flammable air-vapor mixture at storage temperature

Grounding system inspection (NFPA 780 Annex D Section D.1.2):

☑ System intact & in good repair ☑ Securely fastened ☑ Free of corrosion or other damage

Comments

Tank normal vent on 2-inch line, which reduces to a 1-inch line, which connects to an 8-inch carbon filter (see photos). Several ground wires connected to tank and piping. Fill and withdrawal line are same.

Inspection of other appurtenances and repairs

☐ Corrosion ☐ Stressed welds ☐ Bent members ☐ Coating failure Location(s): ______

Resolve Environmental Engineering, Inc.

STI SP001 Formal External Tank Inspection Field Data Collection Sheet

Project Information

Tank name: Waste Tank ST45 | Facility name: Apollo Technologies, Inc., Smyrna, GA | Inspection date: 7/31/2012

Shell Plate Visual Assessment

Plate	Course	Corrosion	Buckling or distortion	Damage	Stress	Cracking	Pinholes	Coating failure	Comments
A	___	☐	☐	☐	☐	☐	☐	☑	Good condition; CF bottom 6"
B,C,D	___	☐	☐	☐	☐	☐	☐	☐	Good condition

Roof Plate Visual Assessment

Plate	Low areas	Corrosion	Buckling or distortion	Damage	Stress	Cracking	Pinholes	Coating failure	Comments
___	☐	☐	☐	☐	☐	☐	☐	☐	Good condition

Ultrasonic thickness testing instrument information

Make: Olympus Panametrics | Model: DL37 Plus | Serial number: 091732108 | Transducer: D7906-SM

Calibration date/time: 7/31/2012

Step block material: 1018 carbon steel

Couplant: Panametrics B2

Step thickness (in):	0.200	0.500		
Measured thickness (in):	0.200	0.500		
Difference (%):	0.0%	0.0%		

☑ Acceptable shell roughness and curvature? ☑ Through-coating transducer used? ☑ Temperature compensation?

Original Shell Thickness Determination

If documentation of original shell thickness available, indicate source:

☐ Original tank documentation ☐ Information from manufacturer

Nominal shell thickness (in): 0.179

☑ Design standard: ___

If no documentation available, measure thickness in several areas with no visible corrosion or pitting:

Measurements (in): 0.175 | 0.174 | 0.174 | 0.174 | 0.174 | Average (in): 0.174

Deficiencies, issues and other observations

Coating failure (CF) on bottom 6 inches of tank; due to former water accumulation inside secondary containment. Roof installed over secondary containment. Evaluate sizing of carbon filter on tank normal venting.

APPENDIX E

INSPECTOR CERTIFICATE

CERTIFICATION

Steel Tank Institute

certifies that

Steven Shugart

has met all of the requirements to become an STI authorized
Level 1 – Aboveground Tank Inspector and a
Level 2 – Aboveground Tank System Inspector
in accordance with the STI Standard SP001

Expiration Date: April 26, 2016 ID#: AST R11167

Dana C. Schmidt
Project Engineer
Steel Tank Institute

Certificate of Completion

Presented to

Steve Shugart

37DL Thickness Gage

Items covered Calibration to proper material, Echo to Echo and Thru Coat calibration modes, proper selection of transducer, Interpretation of A-Scan presentation, effects of paint and temperature, use of alarms, building and downloading data files

Instructor

Eric Blackwell

Olympus NDT

8/27/09

MATERIAL SAFETY DATA SHEET

Revision #:10
Revision date: September 28, 2010

Identity: Bituminous Coal Based Activated Carbon
(For all virgin coal based carbons)

Section 1 - MANUFACTURER

Nichem Company
619 Ramsey Ave.
Hillside, NJ 7205
Tel: 973-399-9810, Fax: 888-288-1138

Section 2 – INGREDIENTS

Component	% by weight	Oral LD50	CAS number	TLV values
Activated carbon	100	>10 g/kg	7440-44-0	N/A

Section 3- HAZARDS INDENTIFICATION

CAUTIN: Wet activated carbon adsorbs oxygen from air. Therefore, the atmosphere in a vessel or confined space may be deficient in oxygen and very hazardous to workers after it is loaded with activated carbon. Before anyone enters such a space, procedures should be followed to ensure ample oxygen availability and to comply with all governmental regulations.

Potential Health Effects: Prolonged or repeated exposure to dust may cause eye and respiratory tract irritation.

Section 4 – PHYSICAL/CHEMICAL CHARATERISTICS

Appearance:	Powder, granular, pellet
Color:	black, dark grey
Odor:	odorless
Ignition temp. ASTM D4366:	300 °C
Boiling Point:	4000 °C
Bulk density ($H_20=1$):	0.4-0.65 g/cc
Vapor pressure:	N/A
Melting point:	N/A
Vapor density:	N/A
Evaporation rate:	N/A
Solubility in water:	Insoluble

Section 5 – FIRE AND EXPLOSION HAZARD DATA

Flash point	N/A
Non-flammable	OSHA Method 16CFR 1500.44 (Incorporated by reference in 29CFR 1910.1200)
Not Spontaneously Combustible	DOT Method 49CFR Part 173, Appendix E.
Extinguishing media	Water, fire fighting foam, dry chemical, or carbon dioxide
Special fire-fighting procedures	Remove all carbon from the building. Fire fighters should wear full protective gear and use self-contained breathing apparatus with a full face mask.
Unusual fire and explosion hazard:	Contact with strong oxidizing agents such as liquid oxygen, chlorine, ozone, or permanganates may result in explosion.

Section 6 – STABILITY AND REACTIVITY DATA

Stability:	extremely stable
Conditions to avoid:	acid, water, high humidity;
Incompatibility:	strong oxidizing agents
Hazardous decomposition products:	carbon monoxide may be generated in the event of fire or high temperature.
Hazardous Polymerization:	will not occur.

Section 7 – HEALTH HAZARD DATA

Routes of entry:	Ingestion or inhalation (dust)
Health hazards:	Inhalation of dust may cause temporary respiratory discomfort. (The acute inhalation LD50 (rat) is >10 g/kg.)
Carcinogenic or other health effects of long-term low-level exposure:	Not established
Signs and symptoms:	No consistent patterns have been established.
Medical conditions generally aggravated by exposure:	Not established

This product is non-hazardous according to the definitions of "health hazard" and "physical hazard" in the OSHA Hazard Communication Law (29 CFR part 1910).

Section 8- FIRST AID MEASURES

Eye	Flush thoroughly with water
Skin	Wash affected area well with soap and water. Get medical help if irritation persists
Ingestion	Give 2-3 glasses of milk or water to dilute. Contact physician or poison control center promptly for instruction. If vomiting occurs, give more fluids.

Inhalation	Remove to fresh air. Get medical help if irritation develops.

Section 9 – SAFE HANDLING AND STORAGE

Waste disposal method: Unused activated carbon does not have any of the Federal E.P.A. characteristics of solid hazardous wastes. Dispose in accordance with governmental regulations.

Handling:	Safety glasses or goggles and rubber gloves are recommended. Use an approved particulate filter if excessive dust is generated. Wash thoroughly after handling. Adequate ventilation
Storage temperature:	Ambient
Pressure:	Atmosphere Store product in a closed dry container Keep away from strong oxidizers, such as liquid oxygen, chlorine, etc. Avoid exposure to water and contaminated air. Store in dry place

Section 10 – PERSONAL PROTECTION

Respiratory protections:	Use a niosh approved particulate filter if excessive dust is generated.
Ventilation:	Local exhaust is recommended.
Protective clothing:	Safety glasses or goggles and rubber gloves are recommended.

Section 11 – TRANSPORTATION INFORMATION

IATA-DGR class	not regulated
IMDG Class	not regulated

Steam activated carbons are excluded from provisions of IATA #395, IMCO Class 4.2 or UN #1362.

Carbon "protocol listed in the United Nations Manual of tests and Criteria (33.3.1) as such, class 4.2 provision for US DOT, IATA, ICAO, ADR and IMDG. Shipments do not apply.

Section 12 – REGULATORY INFORMATION

HCS Classification:	Irritating material
US Federal regulation:	TSCA, no products found SARA 302/304/311/312 extremely hazardous substances: not applicable SARA 302/304 emergency planning and notification: not applicable SARA 302/304/311/312 hazardous chemicals: not applicable SARA 311/312: immediate (acute) health hazard
State regulations:	no products found
International regulation:	
United States:	this product and/or its components are TSCS listed.

Canada: this product and/or its components are DSL listed or acceptable under CEPA

Registration regulation.

Europe:	this product is EINECS listed
Australia:	This product is AICS listed
Japan:	This product contains ENCS and MITI listed components
China:	this product is listed on Chinese IECSC;
South Korea:	this product is ECL listed;
Philippines:	this product is PICCS listed;
Switzerland:	acceptable

Section 13- ACCIDENTAL RELEASE/SPILL

Collect and repackage unused carbon or sweep up and dispose in refuse container.

Clean up spills in a manner that does not disperse dust into air. Handle with industrial standard and safety practices. These include avoiding unnecessary exposure, and removal of material from eye, skin and cloth.

Section 14 – DISPOSAL CONSIDERATON

Activated carbon in its original form, is not hazardous material or hazardous waste.

Spent carbon may be hazardous depending on application.

Follow federal, state and local regulations for disposal;

Spent carbon may be recycled (reactivated).

Section 15- ECOLOGICAL INFORMATION

LC_{50} (minnows)	Not established
Chemical Fate information	Not established
Effect of low concentrations on aquatic life:	Unknown.

Activated carbon in its original form is not harmful to environment. It may adsorb substances in the surroundings.

Section 16- OTHER INFORMATION

Hazard Rating:

HMIS:

- Health -1
- Flammability -1
- Reactivity – 0
- Protective Equipment – To be set by user

Activated carbons are not listed as potential carcinogens by any agency. However, respiratory protection is recommended.

Revision summary:

Eight section format converted to sixteen format. Supersedes all previous issue.

The information herein is given in good faith but no warranty, expressed or implied, is made.

RESOLVE
Environmental Engineering

August 13, 2012

Apollo Technologies, Inc.
1450 South Cobb Industrial Boulevard
Smyrna, Georgia 30082

Attention: Mr. Javeed Syed

Subject: Waste Tank ST45 Piping System Leak Detection Assessment
Apollo Technologies, Inc., Smyrna Facility

Dear Mr. Syed:

The Apollo Technologies Inc. (Apollo) facility in Smyrna, Georgia is subject to the Resource Conservation and Recovery Act (RCRA) Title 40 Code of Federal Regulations (40 CFR) Part 264.191 *Assessment of tank system integrity* and Subpart BB *Air Emission Standards for Equipment Leaks,* and Subpart CC *Air Emission Standards for Tanks, Surface Impoundments, and Containers*. In accordance with the RCRA rules, the facility is required to conduct periodic tank integrity testing and piping system leak detection to determine whether the systems are adequately designed and have sufficient structural strength and compatibility with the waste to be stored or treated, to ensure that the tank will not collapse, rupture, or fail, or that piping system components will not leak. Waste Tank ST45, a 7,400 gallon vertical, steel, single-wall tank storing solvent waste and the piping system are subject to these assessment requirements.

In order to fulfill the tank inspection RCRA requirement, Resolve Environmental Engineering, Inc. (Resolve) performed a Steel Tank Institute (STI) SP001 assessment of Waste Oil Tank ST45 on July 31, 2012. The results are documented in an *Assessment Report Waste Tank ST45 and Piping System* prepared by Resolve and dated August 2012. At the same time of the tank investigation, Resolve conducted an assessment on the piping system. A Method 21 piping system assessment was performed on the waste piping that leads from the manufacturing building to Waste Tank ST45. This letter report documents photoionization detector (PID) readings collected during the piping system leak detection survey.

PID SAMPLE RESULTS

As stated previously, Resolve performed a leak detection survey on the Waste Tank ST45 piping system in accordance with USEPA Method 21, *Determination of Volatile Organic Compound*

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Leaks. Leak detection readings were collected with a MiniRae 3000 volatile organic compound (VOC) analyzer with a photoionization detector (PID) with a range from 0 to 15,000 ppm. An instrument calibration was performed on the MiniRae 3000 prior to beginning the pipe system readings. PID readings at each piping system component are presented in Table 1 attached to this Letter Report.

The inspected piping system is a 3-inch and 2-inch diameter network that goes from Waste Tank ST45 to the manufacturing facility. Several other piping systems are co-located with the Waste Tank ST45 piping system from the inside of the manufacturing facility to the tank farms on the west side of the site. Figure 1 attached shows the layout of the piping system. The following observations were noted regarding the piping system:

- Line 1, nearest to the tank, is a 3-inch horizontal line 7 feet long with the following fittings: (1) 3-inch gate valve; (2) flange mounted flexible pipe; (3) Tee with 2-inch reducer; (4) union; and (5) 90^0 elbow;
- Line 2 is a 2-inch horizontal and vertical line 8 feet long with the following fittings: (1) 45^0 backflow preventer; (2) 90^0 elbow; (3) 90^0 elbow; (4) reducer coupling to 1-inch pipe, valve, and cap; and (5) 1-inch pneumatic emergency shutoff actuator;
- Line 3 is a 3-inch vertical line 4 feet long with the following fittings: (1) 90^0 elbow;
- Line 4 is a 3-inch horizontal line 5 feet long with the following fittings: (1) 90^0 elbow;
- Line 5 is a 3-inch vertical line 1.5 feet long with the following fittings: (1) 90^0 elbow;
- Line 6 is a 3-inch horizontal line 28.5 feet long with the following fittings: (1) threaded coupling; and (2) 3-inch Tee with 2-inch reducer insert;
- Line 7 is a 3-inch horizontal line 21 feet long, which reduces to a 2-inch line for 3.5 feet, then vertical for 2 feet, then horizontal for 3.5 feet with the following fittings: (1) reducer coupling; (2) 90^0 elbow; (3) 90^0 elbow; (4) union; and (5) butterfly valve with a hose connector;
- Line 8 is a 3-inch/2-inch vertical line 9 feet long with the following fittings: (1) valve; (2) union; and (3) 90^0 elbow;
- Line 9 is a 2-inch horizontal line 58 feet long with the following fittings: (1) 45^0 backflow preventer; (2) threaded coupling; (3) union; and (4) 90^0 elbow;
- Line 10 is a 2-inch horizontal line 34 feet long with the following fittings: (1) threaded coupling; and (2) 90^0 elbow;
- Line 11 is a horizontal line 22 feet long with the following fittings: (1) union; (2) threaded coupling; and (3) 90^0 elbow;

- Line 12 is a vertical line 6 feet long with the following fittings: (1) 90^0 elbow;
- Line 13 is a horizontal line 25 feet long with the following fittings: (1) threaded coupling; and (2) 90^0 elbow; and
- Line 14 is a horizontal and vertical line inside the manufacturing building with the following fittings: (1) four 90^0 elbows; and (2) butterfly valve with hose connector.

In accordance with Method 21, an instrument reading of greater than 10,000 parts per million (ppm) is considered a leak. Resolve did not observe any readings approaching 10,000 ppm. As shown in Table 1, there were no PID readings on any of the piping system components; all readings were 0 parts per million (ppm). Resolve also collected a reading on the top of the tank at the emergency vent and at the exhaust from the carbon filter system. The PID readings were 0 ppm and 300 ppm, respectively.

CONCLUSION

Resolve did not detect any VOC readings at any of the piping system components; therefore, there were not any detected leaks. Resolve measured low PID readings at the exhaust of the carbon filter system. The carbon filter size may have to be increased to minimize VOC exhaust.

Sincerely,
Resolve Environmental Engineering, Inc.

Ian Lundberg, P.E.
Principal Engineer

Attachments: Table 1: Piping System Components and PID Readings
Figure 2: Piping System Layout

Waste Tank ST45 Piping System Leak Detection Assessment, July 2012

APOLLO TECHNOLOGIES, INC., SMYRNA, GEORGIA

TABLE 1: PIPING SYSTEM COMPONENTS AND PID READINGS

Component	Component #	Size	PID Reading
Line 1			
Gate valve	1	3-inch	0 ppm
Flange mounted pipe	2	3-inch	0 ppm
Tee with 3"/2" reducer	3	3-inch/2-inch	0 ppm
Union	4	3-inch	0 ppm
90^0 elbow	5	3-inch	0 ppm
Line 2			
45^0 backflow preventer	6	2-inch	0 ppm
90^0 elbow	7	2-inch	0 ppm
90^0 elbow	8	2-inch	0 ppm
Reducer coupling to 1" w/ valve	9	2-inch/1-inch	0 ppm
Pneumatic emergency shutoff	10	1-inch	0 ppm
Line 3			
90^0 elbow	11	3-inch	0 ppm
Line 4			
90^0 elbow	12	3-inch	0 ppm
Line 5			
90^0 elbow	13	3-inch	0 ppm
Line 6			
Threaded coupling	14	3-inch	0 ppm
Tee with 3"/2" reducer	15	3-inch/2-inch	0 ppm
Line 7			
Reducer coupling to 2-inch	16	3-inch/2-inch	0 ppm
90^0 elbow	17	2-inch	0 ppm
90^0 elbow	18	2-inch	0 ppm
Union	19	2-inch	0 ppm
Butterfly valve w/ hose conn.	20	2-inch	0 ppm
Line 8			
Valve	21	2-inch	0 ppm
Union	22	2-inch	0 ppm
90^0 elbow	23	2-inch	0 ppm
Line 9			
45^0 backflow preventer	24	2-inch	0 ppm
Threaded coupling	25	2-inch	0 ppm
Union	26	2-inch	0 ppm
90^0 elbow	27	2-inch	0 ppm
Line 10			
Threaded coupling	28	2-inch	0 ppm
90^0 elbow	29	2-inch	0 ppm

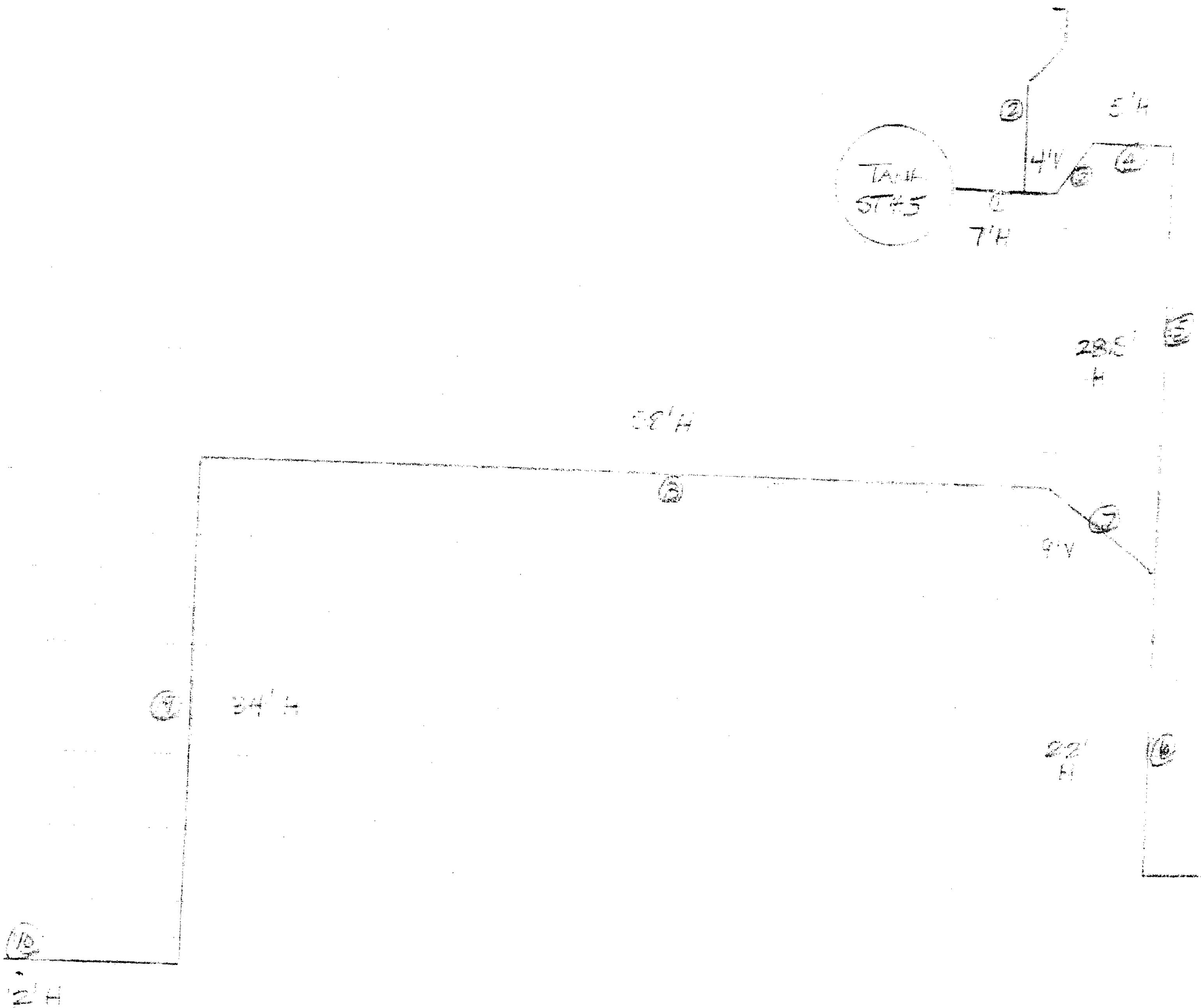
Waste Tank ST45 Piping System Leak Detection Assessment, July 2012

APOLLO TECHNOLOGIES, INC., SMYRNA, GEORGIA

TABLE 1: PIPING SYSTEM COMPONENTS AND PID READINGS

Component	Component #	Size	PID Reading
Line 11			
Union	30	2-inch	0 ppm
Threaded coupling	31	2-inch	0 ppm
90^0 elbow	32	2-inch	0 ppm
Line 12			
90^0 elbow	33	2-inch	0 ppm
Line 13			
Threaded coupling	34	2-inch	0 ppm
90^0 elbow	35	2-inch	0 ppm
Line 14			
90^0 elbow	36	2-inch	0 ppm
90^0 elbow	37	2-inch	0 ppm
90^0 elbow	38	2-inch	0 ppm
90^0 elbow	39	2-inch	0 ppm
Butterfly valve w/ hose conn.	40	2-inch	0 ppm
Tank Appurtenances			
Emergency Vent	-	8-inch	0 ppm
Carbon Filter Exhaust	-	2-inch	300 ppm

Note: ppm - parts per million



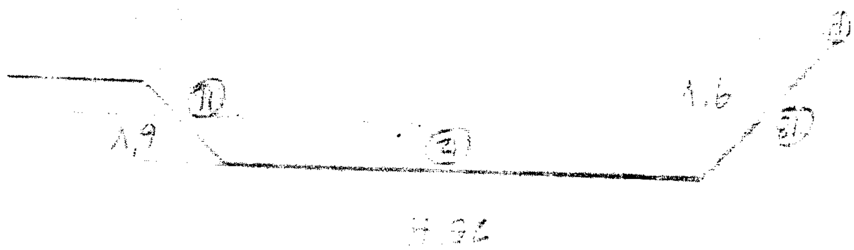
① - Line Number

H - Horizontal

V - Vertical

WASTE TANK ST#5 PIPING

APPLIED TECHNOLOGY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RESOLVE
Environmental Engineering

August 27, 2012

Apollo Technologies, Inc.
1450 South Cobb Industrial Boulevard
Smyrna, Georgia 30082

Attention: Mr. Javeed Syed

Subject: Waste Tank ST45 Transfer Pump Leak Detection Assessment
Apollo Technologies, Inc., Smyrna Facility

Dear Mr. Syed:

The Apollo Technologies Inc. (Apollo) facility in Smyrna, Georgia is subject to the Resource Conservation and Recovery Act (RCRA) Title 40 Code of Federal Regulations (40 CFR) Part 264.191 *Assessment of tank system integrity* and Subpart BB *Air Emission Standards for Equipment Leaks*, and Subpart CC *Air Emission Standards for Tanks, Surface Impoundments, and Containers*. In accordance with the RCRA rules, the facility is required to conduct periodic leak detection on Waste Tank ST45, a 7,400 gallon vertical, steel, single-wall solvent waste storage tank. This letter is an addendum to the letter report dated August 13, 2012, and includes results from leak testing performed at the transfer pump for ST45 that was erroneously omitted from the August 13 report.

On July 31, 2012, a leak detection survey was performed by Mr. Steven Shugart of Resolve Environmental Engineering, Inc. (Resolve) on the pump that facilitates transfer of waste solvent between the manufacturing building and Waste Tank ST45, in accordance with USEPA Method 21, *Determination of Volatile Organic Compound Leaks*. Leak detection readings were collected with a MiniRae 3000 volatile organic compound (VOC) analyzer with a photoionization detector (PID) with a range from 0 to 15,000 ppm. An instrument calibration was performed on the MiniRae 3000 prior to beginning the leak detection readings.

In addition to the piping system and tank leak detection readings, Resolve collected PID readings within the pump room and at the location of the transfer pump. Resolve detected a background concentration of 25 to 50 parts per million (ppm) inside the pump room. Resolve did not detect any higher readings in the vicinity of the pump or the piping inside the pump room. Therefore, no leaks were detected in the vicinity of the ST45 transfer pump.

1444 Waterford Green Drive Marietta, Georgia 30068-2525 t 770-650-9990 f 770-651-9991

Sincerely,
Resolve Environmental Engineering, Inc.

GEORGIA REGISTERED No. 22139 PROFESSIONAL ENGINEER IAN G. LUNDBERG

Ian Lundberg, P.E.
Principal Engineer

BB/CC
OR

ATTACHMENT 3

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Smyrna Hazardous Waste Tank (ST45)
Air Emission Control System

Background

- 7,400 gallon tank, fixed roof, closed vent system with control device
- Carbon vapor treatment system using granular activated carbon
- Approximately 250 lbs (2 units) capacity of carbon
- Organic vapors emissions are estimated to be approximately 70 lbs per year for breathing and working losses using EPA Tanks 4.09d emission software based on characteristics of the hazardous waste.
- Carbon change out is estimated to be required to be changed out once per nine months of operation.
- The control device is designed and operated to reduce the total organic content of the inlet vapor stream by at least 95% by weight and an outlet concentration less than 500ppm above background.
- Demonstration that the carbon control device achieves the performance requirements will be achieved through weekly measurement of the inlet and outlet vapor concentrations using a calibrated portable VOC monitor. This monitoring frequency exceeds the minimum monitoring frequency of 20% of design breakthrough, which would be a monitoring frequency of once per every 7 weeks.

Carbon Treatment System

In accordance with 40CFR 265.1035(b)(4), a two vessel carbon adsorption treatment system is utilized in which the organic vapor emissions pass from the hazardous waste storage tank through the first container and then into a second container prior to venting to the atmosphere. The inlet vapor is designed to enter the bottom of the first container, pass through this container and then enter into the bottom of the second container and exhaust through the top of the carbon of the second container. A photo of the carbon system is provided as Attachment 1. Each container is a 55-gallon closed top metal drum with approximately 125 pounds of granular activated carbon (specification of PNV 1100 provided as Attachment 2) within each drum. A sample port for monitoring inlet vapor concentrations is installed in the 2-inlet pipe leading from ST45 storage tank and outlet vapor emissions are measured at the vent outlet which is also a 2-inch down-turned pipe.

Based on the vapor emission rates as generated by the utilization of EPA Tanks 4.09d (See Attachment 3) using waste properties determined by characterization, it is anticipated that the organic vapor emissions will be approximately 70 pounds per year. For design purposes a vapor emission rate of 70 pounds per year has been utilized.

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Smyrna Hazardous Waste Tank (ST45)
Air Emission Control System

The adsorption rate for carbon is highly variable and depends heavily on the actual organic substances present in the vapor stream, respective of the vapor pressure and molecular weight of the organic compounds. Based in information provided by Air Pollution Training Institute and carbon supplier literature (Attachment 4) the adsorption capacity of activated carbon can range from 1 to 35 pounds of organic adsorption per pound of carbon. Based on a molecular weight of 190 and maximum vapor pressure of 0.5 psia, the conservative estimated carbon adsorption rate is 20 pounds of organic vapor per 100 pounds of carbon. Therefore, with 250 pounds of carbon in the system it is anticipated that 50 pounds of organic vapor emissions will be controlled by this amount of carbon. Since the estimated amount of vapor emissions is 70 pounds per year, the anticipated breakthrough time would be (50 lbs / 70 lb/yr * 52 week/yr) = 37 weeks or approximately 9 months.

The carbon system will be monitored once per week by measuring both the carbon system inlet and outlet organic vapor concentration using a calibrated portable VOC analyzer. The organic vapor concentration readings will be recorded in the hazardous waste tank and piping system inspection log. Upon determination that breakthrough may be occurring sooner than this design estimate would indicate, the carbon will be replaced with new carbon and the old carbon will be properly disposed based on characterization of the material. The determination of breakthrough will be made when a sudden increase in outlet organic vapor concentration is noted in consecutive weekly observations.

Certification

This control device has been designed based on standard industry practices, the properties of granular activated carbon, and performance information provided within Section 4 of the "US EPA Air Pollution Training Institute, Control of Gaseous Emissions, APTI Course 415 Manual, January 2000". This control device is designed to operate as documented by this analysis.

Name: Christopher Hurst
Title: Vice President, EHS
Signature:

Date: August 27, 2012

Smyrna Hazardous Waste Tank (ST45)
Air Emission Control System

ATTACHMENT 1
Carbon System Photo

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Smyrna Hazardous Waste Tank (ST45)
Air Emission Control System

ATTACHMENT 2
Carbon Specification

HAZARDOUS WASTE VAPOR CONTROL CARBON

NICHEM CO.

619 Ramsey Ave., Hillside, NJ 07205, USA, tel: (973)399-9810, fax: (973)399-8818

PNV 1100 Granular Activated Carbon

Characteristics:

PNV 1100 is a virgin high activity granular activated carbon made from high grades of bituminous coal and is activated by steam method. Its high surface area, excellent pore structure, and rapid adsorption rate makes it an ideal adsorption product while the particle size of 4x8 mesh size maintains the superior pressure drop characteristics. The typical application for PNV 1100 includes:

VOC Control	Odor control	Air Purification	Catalyst Carrier

Typical specification:

US mesh series	4x8
Percentage on 4 mesh max	5%
Percentage through 8 mesh, max	5%
Butane Activity, wt%, min	23.8
Calculated CCl4 No. wt%, min	60
Moisture as packed, max	5%
Hardness, min	95%
Bulk density, lb/ft^3	25-31.5
*Total surface area (N_2 BET)	950

* *For general information and are not to be used as purchase specifications.*

Commercial Information:

Type PNV 1100 is packed in 1000 lb sacks or 50 lb bags. Other packaging is available upon request.
Shipping point: Hillside, New Jersey

AP3-60 & AP4-60

For Air and Gas Purification

CALGON CARBON CORPORATION

Description

AP3-60 and AP4-60 are 3 and 4 mm pellet activated carbons designed for air and gas purification applications. They are produced by high temperature steam activation of coal. This produces a porous material with a high surface area allowing it to adsorb a wide range of organic compounds.

Applications

AP3-60 and AP4-60 are suited for either regenerable or one-time use systems depending on the application. Typical applications include:

- Ventilation and air conditioning systems
- Groundwater remediation
- Paint spray booths
- Industrial odor removal
- Solvent recovery
- Volatile Organic Compound (VOC) abatement

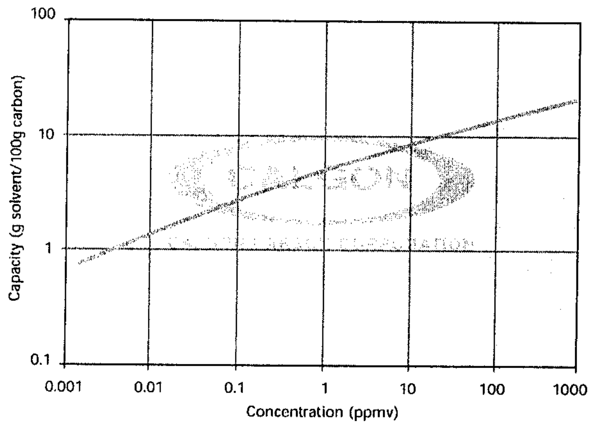
Design Considerations

When faster adsorption kinetics are desired, AP3-60 is recommended; however, for lower pressure drop applications, AP4-60 is preferred. Pressure drop curves for both products are shown to the right.

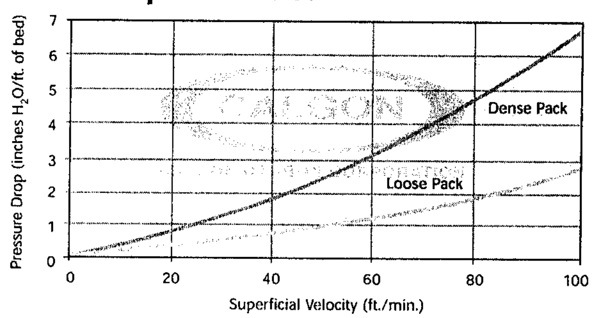
Safety Message

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed, including all applicable Federal and State requirements.

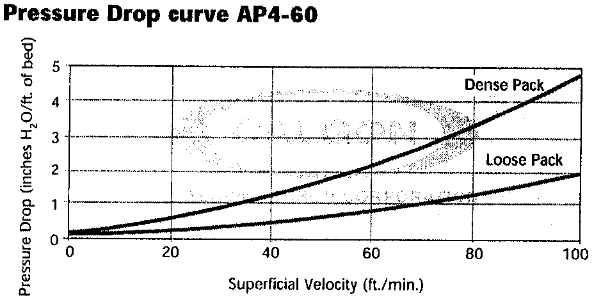
Isotherm for Benzene at 25°C and 1 atm



Pressure Drop curve AP3-60



Pressure Drop curve AP4-60



Specifications	AP3-60	AP4-60
CCl_4 by weight	60% (min)	60% (min)
Hardness Number	90 (min)	90 (min)
Moisture , as packed by weight	4% (max)	5% (max)
Screen Size by weight, U.S. Sieve Series		
Through 6 mesh	–	5% (max)
Through 8 mesh	5% (max)	–

Features	Benefits
Cylindrical pellets with high hardness	Provides a lower pressure drop which reduces fan energy consumption as compared to granular activated carbon. Ensures excellent resistance to mechanical and thermal stress. Low fines generation and less dust.

CALGON
CALGON CARBON CORPORATION

Making Water and Air Safer and Cleaner

Your local representative

Calgon Carbon Corporation
P.O. Box 717
Pittsburgh, PA USA 15230-0717
1-800-422-7266
Tel: 1-412-787-6700
Fx: 1-412-787-6713

Chemviron Carbon
European Operations of
Calgon Carbon Corporation
Zoning Industriel C de Feluy
B-7181 Feluy, Belgium
Tel: + 32 (0) 64 51 18 11
Fx: + 32 (0) 64 54 15 91

Calgon Carbon Asia PTE LTD
9 Temasek Boulevard
#08-01A Suntec Tower Two
Singapore 038989
Tel: + 65 6 221 3500
Fx: + 65 6 221 3554

VENTSORB®

Powdered Activated Carbon

Description

VENTSORB canisters, each containing 180 pounds of activated carbon, are ideal for low-flow air purification applications at industrial and municipal facilities. These economical adsorption systems control small volume organic contaminants and/or odorous gas emissions from:

- Storage tank vents
- Reactor vents
- API separator vents
- Sludge thickener tanks at waste treatment plants
- Sewer gas vents, wet stations, and weir boxes at chemical and municipal waste treatment plants
- Chemical plant wastewater holding tanks
- Laboratory hood exhausts
- Landfills
- Air-stripper off-gases

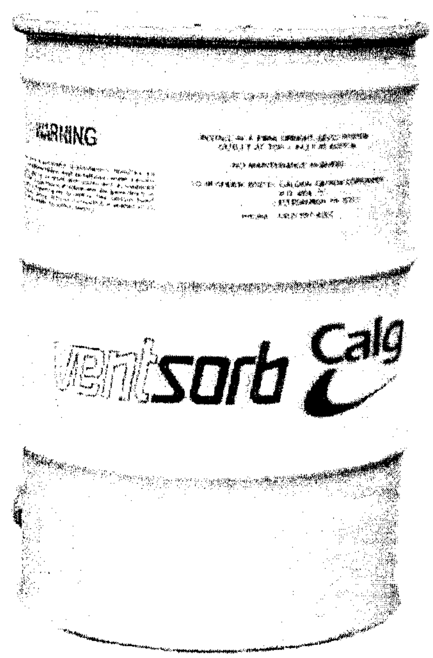
The 55-gallon VENTSORB canisters contain all the elements found in a full-scale adsorption system vessel: activated carbon, inlet connection and distributor, and an outlet connection for the purified air stream.

Features

VENTSORB canisters offer industrial and municipal users several important features and benefits including:

- Effective treatment to remove a variety of vapor phase organic contaminants and odor-causing compounds
- Continuous treatment at varying flow rates and concentrations
- Simple installation and operation
- Flexibility to be installed in series or multiple units in parallel
- Supplied with activated carbon selected specifically for the application
- Practical disposal option: pre-approved spent carbon canisters may be returned to Calgon Carbon Corporation for safe carbon reactivation
- Low cost per unit makes carbon treatment economical

Specifications	VENTSORB
Vessel	Open head steel canister
Max. Operating Pressure	4 psig
Cover	Removable steel cover, 12 gauge bolt ring
Internal Coating	Heat-cured phenolic epoxy
External Coating	Baked enamel white
Temperature	140°F (60°C) Continuous 180°F (82°C) intermittent
Inlet	2" FNPT
Outlet	2" FNPT
Max Flow	100 cfm (2.83m3/min)
Carbon	180 lbs. AP4-60, BPL 4x10, or VPR
Ship Weight	219 lbs. (99.4 kg)



Applications

Chemical, petrochemical, food, pulp and paper, and many other industrial plants, along with municipal sewage treatment facilities, are frequent users of VENTSORB for continuous control of vented emissions. Examples of user applications include:

Storage Tank Vents

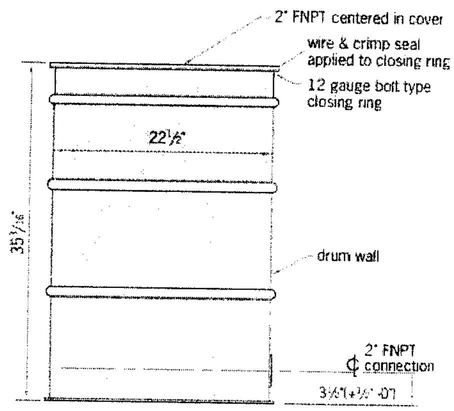
VENTSORB is widely used to control evaporative losses vented from storage tanks. Typically these vapors are emitted during tank filling and emptying. In one application, a glycerin manufacturer uses the canisters to purify ambient air drawn into the storage tanks during product transfer. The adsorption process helps prevent contamination of the company's glycerin product. The VENTSORB units provide greater than six months of service for this application.

Reactor Vents

A pesticide manufacturer is using multiple VENTSORB on five reactor vessels to control trace amounts of odorous methylamine and diethylamine (by-products of a caustic scrubbing process). Each VENTSORB unit handles a 30 cfm air stream containing 15 ppm of amine vapors. The units provide greater than three months of service for this application.

API Separator Vents

A major refinery uses VENTSORB units to control odorous emissions from settling basins where oil is separated from wastewater that is discharged in condensate, blow-down, or drain systems. For this application, API separators are covered and vented to comply with local air pollution control regulations. The air stream is pulled through two VENTSORB units operating in parallel configuration at 100 cfm.



Installation

VENTSORB canisters are shipped ready for installation. Each canister is self-supporting and should be placed on a level, accessible area as near as possible to the emission source. Installation is simple, requiring just a flexible hose or pipe to connect the vent to the 2-inch FNPT bottom inlet of the canister.

If the VENTSORB will be vented directly to outside air, a U-shaped outlet pipe or rain hat (such as a pipe tee) is recommended to prevent precipitation from entering the unit.

VENTSORB canisters operate from a continuous suction across the vent. The suction can be produced by a blower or by using the positive pressure inside the tank or process vessel. In many cases, the pressure or surge of pressure within the tank or vessel is sufficient to overcome the pressure drop across the canister, eliminating the need for a blower. Please consult the pressure drop data in this bulletin for more information.

Maximum recommended air flow through a VENTSORB is 100 cfm. If higher flows are encountered, plant operators should install two or more canisters in parallel configuration. When VENTSORB canisters are used to control vapors from organic solvent storage tanks, the following precautions are recommended:

- A safety relief valve must be provided. This protects the storage tank should the VENTSORB become plugged or blocked in any fashion. Such a vent would open in an emergency situation, thereby relieving pressure.
- Under appropriate conditions a flame arrestor and/or backflow preventor must be installed as shown in this bulletin's storage tank installation drawing. This prevents backflow of air through the VENTSORB when the storage tank is empty.
- Pre-wetting the carbon helps dissipate excessive heat that may be caused by high organic compound concentration (>0.5 to 1.0 Vol.%).

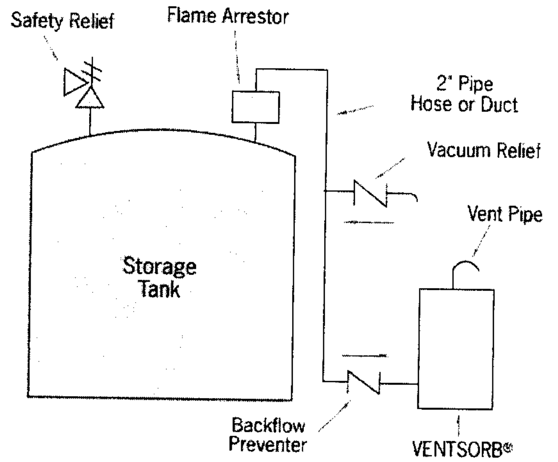
If VENTSORB canisters are used to control organic emissions from air-strippers or other high moisture content air streams, Calgon Carbon Corporation recommends that humidity in the air stream be reduced to under 50 percent. Lower humidity optimizes adsorptive capacity of the carbon. In addition, for similar applications that generate a condensate, Calgon Carbon Corporation recommends installation of a drain on the inlet piping.

Safety Considerations

While complying with recommended installation instructions, plant operators should also be aware of these additional heat-related safety considerations:

- When in contact with activated carbon, some types of chemical compounds, such as those from the ketone and aldehyde families, and some organic acids or organic sulfur compounds, may react on the carbon surface causing severe exotherms or temperature excursions. **If you are unaware or unsure of the reaction of an organic compound on activated carbon, appropriate tests should be performed before placing a VENTSORB in service.**

Typical VENTSORB Installation at Storage Tank



- Heat of adsorption can lead to severe temperature excursions at high concentrations of organic compounds. Heating may be controlled by diluting the inlet air, by time weighting the inlet concentration to allow heat to dissipate, or by pre-wetting the carbon.
- **Do not use VENTSORB with ST1-X carbon in petrochemical or chemical industry applications.**
- ST1-X carbon can liberate heat by reacting chemically with oxygen. To prevent heat within a vessel, the carbon must not be confined without adequate air flow to dissipate the heat. In situations where there is insufficient or disrupted air flow through the vessel, the chemical reaction can be prevented by sealing the inlet and outlet connections to the vessel.

Safety Considerations

For temperatures greater than 140°F, Calgon Carbon recommends that personnel protection be provided. The form of protection is determined per the end user's specific plant practices and standards. Also note that at elevated temperatures, the paint may discolor.

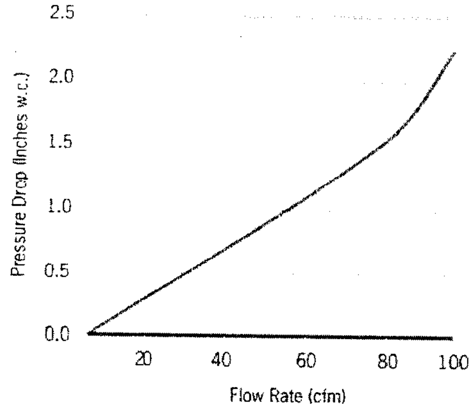
Safety Message

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed, including all applicable Federal and State requirements.

Return of VENTSORB

Arrangements should be made at the time of purchase to return canisters containing spent carbon. Calgon Carbon Corporation can provide instructions on how to sample the spent carbon and arrange for carbon acceptance testing. The spent carbon is reactivated by Calgon Carbon Corporation, and all of the contaminants are thermally destroyed. Calgon Carbon Corporation will not accept VENTSORB canisters for landfill, incineration, or other means of disposal.

Pressure Drop



VENTSORB cannot be returned to the company unless the carbon acceptance procedure has been completed, an acceptance number provided, and the return labels (included with the unit at the time of purchase) are attached.

VENTSORB must be drained and inlet/outlet connections must be plugged prior to return to Calgon Carbon Corporation. Pressure drop through a VENTSORB unit is a function of the process air flow as shown in the graph. A VENTSORB canister can handle up to 100 cfm at a pressure drop of less than 2.5 inches of water column. If higher flows or lower pressure drop is needed, multiple canisters may be installed in parallel operation. The maximum canister pressure should not exceed 4 psig.

Calgon Carbon Air Purification Systems

VENTSORB is specifically designed for a variety of small applications. Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a range of flow rates and carbon usages to meet specific applications.

Carbon Life Estimate

This table lists the theoretical adsorption capacities for several compounds. The adsorption capacity for nonpolar organic compounds increases with the boiling point, molecular weight, and concentration of the air contaminant. Estimate the life of a VENTSORB canister for other organic compounds by matching them with compounds of similar boiling points and molecular weight in this table. Low molecular weight (less than 50) and/or highly polar compounds such as formaldehyde, methane, ethanol, etc. will not be readily adsorbed at low concentrations.

Note: The standard VENTSORB canister contains 180 pounds of AP4-60 carbon. When removing hydrogen sulfide and mercaptans from moist air vented from sewage operations, greater efficiency will be achieved by using a VENTSORB canister which contains specially impregnated ST1-X carbon. A VENTSORB containing ST1-X carbon can remove up to 40 pounds of hydrogen sulfide and 15 pounds of methyl mercaptan.

Theoretical Capacities*

Pounds Adsorbed per VENTSORB at Given Concentration of Contaminant

	Boiling Point (°C)	Molecular Weight (g)	Lbs. @ 10 ppm	Lbs. @ 100 ppm	Lbs. @ 1,000 ppm
Acrylonitrile	77.3	53.1	6	12	24
Benzene	80.1	78.1	14	23	36
n-Butane	-0.5	58.1	4	8	13
Carbon Tetrachloride	76.8	153.8	40	56	76
Dichloroethylene	37.0	97.0	12	21	35
Methylene	40.2	84.9	3	7	18
Freon 114	3.8	170.9	11	19	33
n-Hexane	68.7	86.2	18	25	34
Styrene	145.2	104.1	45	57	71
Toluene	110.6	92.1	34	44	58
Trichloroethylene	87.2	131.4	33	50	73

* Theoretical capacity based on 70° F, 1 atm pressure, less than 50 percent humidity, and 180 pounds of carbon using isotherm data for AP4-60 carbon.

Warranty

Calgon Carbon Corporation warrants that the VENTSORB canister will be free from defects in materials and workmanship for a period of 90 days following the date of purchase. In the event of a breach of this warranty, Calgon Carbon Corporation will, in its discretion, repair or replace any defective parts or the complete unit during the warranty period. This warranty does not apply to defects caused by (i) normal wear and tear, (ii) accident, disaster or event of force majeure, (iii) misuse, fault or negligence of or by Buyer, (iv) use of the VENTSORB canister in a manner for which it is not designed, (v) use of media in the VENTSORB canister not supplied by Calgon Carbon Corporation, (vi) external causes such as, but not limited to, power failure or electrical power surges, or (v) improper storage and handling of the VENTSORB canister. **Except as expressly provided in this warranty statement, Calgon Carbon Corporation disclaims all other warranties, whether express or implied, oral or written, including without limitations all implied warranties or merchantability or fitness for particular purpose. Calgon Carbon Corporation does not warrant that the VENTSORB canisters are error-free or will accomplish any particular result. Any advice or assistance furnished by Calgon Carbon Corporation in relation to the VENTSORB canister provided for hereunder shall not give rise to any warranty or guarantee of any kind. This warranty will take precedence over any and all other warranties unless specifically disclaimed and referenced by Calgon Carbon Corporation.**

Limitation of Liability

Calgon Carbon Corporation' liability and the Buyer's exclusive remedy for any cause of action arising out of this transaction, including, but not limited to, breach of warranty, negligence and/or indemnification, is expressly limited to a maximum of the purchase price of the VENTSORB canister sold hereunder. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. Under no circumstance shall Calgon Carbon Corporation be liable for any incidental, consequential, punitive, exemplary, or special damages of any kind arising as a result of or in connection with the VENTSORB canisters, regardless of the cause giving rise to any claim. Nor shall Calgon Carbon Corporation be liable for loss of profits or fines imposed by governmental agencies. In no event shall Calgon Carbon Corporation's liability exceed the purchase price paid by purchaser, for any reason, whether by reason of breach of contract, tort, indemnification, warranty, or otherwise. This limitation of this liability statement will take precedence over any and all other liability provisions unless specifically disclaimed and referenced by Calgon Carbon Corporation.

Making Water and Air Safer and Cleaner

www.calgoncarbon.com

CalgonCarbon

Corporate Headquarters
Calgon Carbon Corporation
500 Calgon Carbon Drive
Pittsburgh, PA USA 15205
1-800-422-7266
Tel: 1-412-787-6700
Fx: 1-412-787-6713
www.calgoncarbon.com

Chemviron Carbon
Zoning Industriel C de Feluy
B-7181 Feluy, Belgium
Tel: + 32 (0) 64 51 18 11
Fx: + 32 (0) 64 54 15 91

Your local representative

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Smyrna Hazardous Waste Tank (ST45)
Air Emission Control System

ATTACHMENT 3
AST Vapor Emission Estimate using EPA Tanks 4.09d

 HAZARDOUS WASTE TANK EMISSIONS

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	AST45
City:	Smyrna
State:	Georgia
Company:	Apollo
Type of Tank:	Vertical Fixed Roof Tank
Description:	Smyrna Apollo Hazardous Waste Tank

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	8.00
Liquid Height (ft) :	19.68
Avg. Liquid Height (ft):	18.00
Volume (gallons):	7,400.00
Turnovers:	18.00
Net Throughput(gal/yr):	133,200.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Atlanta, Georgia (Avg Atmospheric Pressure = 14.22 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

AST45 - Vertical Fixed Roof Tank
Smyrna, Georgia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg	Min	Max.	Vapor Mol Weight	Liquid Mass Fract	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
hazardous waste	All	63.22	57.90	68.54	61.27	0.1000	0.0300	0.5000	190.0000			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

AST45 - Vertical Fixed Roof Tank
Smyrna, Georgia

Annual Emission Calcaulations	
Standing Losses (lb):	8.8343
Vapor Space Volume (cu ft):	100.5310
Vapor Density (lb/cu ft):	0.0034
Vapor Space Expansion Factor:	0.0719
Vented Vapor Saturation Factor:	0.9895
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	100.5310
Tank Diameter (ft):	8.0000
Vapor Space Outage (ft):	2.0000
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	18.0000
Roof Outage (ft):	0.0000
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.0000
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0000
Shell Radius (ft):	4.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0034
Vapor Molecular Weight (lb/lb-mole):	190.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1000
Daily Avg. Liquid Surface Temp. (deg. R):	522.8858
Daily Average Ambient Temp. (deg. F):	61.2542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	520.9442
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,452.3034
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0719
Daily Vapor Temperature Range (deg. R):	21.2830
Daily Vapor Pressure Range (psia):	0.4700
Breather Vent Press. Setting Range(psia):	0.0300
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1000
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0300
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5000
Daily Avg. Liquid Surface Temp. (deg R):	522.8858
Daily Min. Liquid Surface Temp. (deg R):	517.5651
Daily Max. Liquid Surface Temp. (deg R):	528.2066
Daily Ambient Temp. Range (deg. R):	19.9583
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9895
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.1000
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	60.2571
Vapor Molecular Weight (lb/lb-mole):	190.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1000
Annual Net Throughput (gal/yr.):	133,200.0000
Annual Turnovers:	18.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	7,400.0000
Maximum Liquid Height (ft):	19.6802
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	69.0915

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

AST45 - Vertical Fixed Roof Tank
Smyrna, Georgia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
hazardous waste	60.26	8.83	69.09

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Smyrna Hazardous Waste Tank (ST45)
Air Emission Control System

ATTACHMENT 4
Reference Literature

Chapter 4

Adsorption

OBJECTIVES

Terminal Learning Objective

At the end of this chapter, the student will understand the basics of adsorption systems.

Enabling Learning Objectives

4.1 Distinguish among the various types of adsorption systems.
4.2 Identify the principles of operation that apply to adsorption systems.
4.3 Identify the factors that affect the performance of an adsorption system.
4.4 Determine the areas that need to be monitored in an adsorption system.

Adsorption processes have been used since the 1950s for the high-efficiency removal of a wide variety of organic vapors and several types of inorganic gases. The use of adsorption processes has been expanding recently due to innovations in the designs of the systems and to the development of new adsorbents.

Adsorption systems designed for odor control and other low contaminant concentration applications (<10 ppm) are relatively simple. In these cases, the adsorbent bed is discarded as it approaches saturation with the contaminant. These systems are termed *nonregenerative* because the absorbent material is not reused.

Adsorption processes are also used extensively on large-scale applications having solvent vapor concentrations in the range of 10 to 10,000 ppm. Because of the large quantities of adsorbent needed, it is uneconomical to discard the absorbent. Prior to becoming saturated with the solvents, the adsorbent is isolated from the gas stream and treated to drive the solvent compounds out of the solid adsorbent and into a small-volume, high-concentration gas stream. The desorbed gas stream is then treated to recover and reuse the solvents. The adsorbent is cooled (if necessary) and returned to adsorption service.

Adsorber systems that operate continuously must have (1) multiple fixed beds of adsorbent, (2) fluidized bed contactors with separate adsorption and desorption vessels, or (3) rotary bed adsorbents that cycle continuously between adsorption and desorption operations. Because the adsorbent is treated and placed back in service, these adsorption processes are termed *regenerative*.

Adsorption systems are being used as preconcentrators for thermal or catalytic oxidizer systems. The high-concentration, lower-volume organic vapor stream generated during adsorber bed desorption is well-suited for oxidation because fuel requirements in the oxidizer are minimized. This preconcentrator application has expanded the use of adsorption for low-concentration sources (10 to 1,000 ppm organic vapor) and for multi-component organic vapor streams.

Adsorption processes usually operate at efficiencies of 90% to 98% over long time periods. They can be vulnerable to a variety of operating problems, such as the gradual loss of adsorption capacity, plugging of the adsorbent beds, and corrosion. The onset of these problems can usually be identified by shifts in the operating conditions and by increases in the stack contaminant concentrations.

4.1 Types and Components of Adsorption Systems

Adsorbents

During adsorption, the gas stream passes through a bed or layer of highly porous material called the *adsorbent*. The compound or compounds to be removed, termed the *adsorbate(s)*, diffuse to the surface of the adsorbent and are retained because of weak attractive forces, while the carrier gas passes through the bed without being adsorbed. Adsorption occurs on the internal surfaces of the materials as shown in Figure 4-1.

The most common types of adsorbents for pollution control applications are activated carbons, zeolites (molecular sieves), and synthetic polymers. Other types of adsorbents, such as silica gel and activated alumina, are used primarily for dehydrating gas streams.

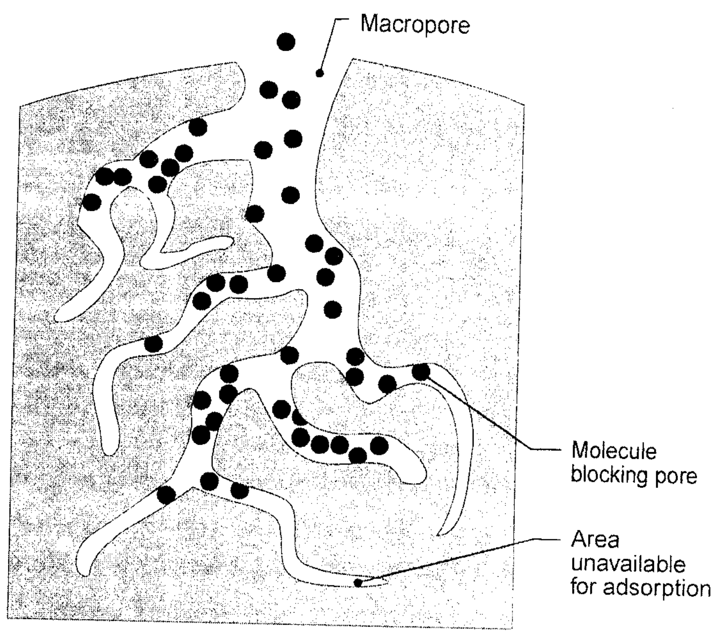


Figure 4-1. Vapor adsorbed into pores of adsorbent.

Activated Carbon

Activated carbon can be produced from a variety of raw materials such as wood, coal, coconut, nutshells, and petroleum-based products.

The activation process takes place in two steps:

1. First, the feedstock is *pyrolyzed*. This involves heating the material in the absence of air to a temperature high enough (e.g., 1,100°F or 590°C) to drive off all volatile material. Carbon and small quantities of ash are left.
2. To increase the surface area, the carbon is then "activated" by using steam, air, or carbon dioxide at higher temperatures. These gases attack the carbon and increase the pore structure. The temperatures involved, the amount of oxygen present, and the type of feedstock all greatly affect the adsorption qualities of the carbon.

Manufacturers vary these parameters to produce activated carbons suitable for specific purposes. There are a large number of commercial brands available that have significantly different properties to serve various applications. Accordingly, the term *activated carbon* applies to an entire category of diverse materials, not to a specific material.

Because of its nonpolar surface, activated carbon is used to control emissions of a wide variety of organic solvents and toxic gases. Carbons used in gas phase adsorption systems are manufactured in a granular form or in a carbon fiber form. The granular carbon pellets are usually between 4 x 6 and 4 x 20 mesh. Bulk density of the granular-pellet-packed beds can range from 5 to 30 lb_m/ft^3 (0.08 to 0.48 gm/cm^3), depending on the internal porosity of the carbon. Total surface area of the macropores and micropores in activated carbon can range from 600 to 1,600 m^2/gm.

Zeolites (Molecular Sieves)

Unlike activated carbon adsorbents that are amorphous in nature, molecular sieves have a crystalline structure. The pores are uniform in diameter.[1, 2] Molecular sieves can be used to capture or separate gases on the basis of molecular size and shape. Simplified sketches of several zeolites are shown in Figure 4-2.

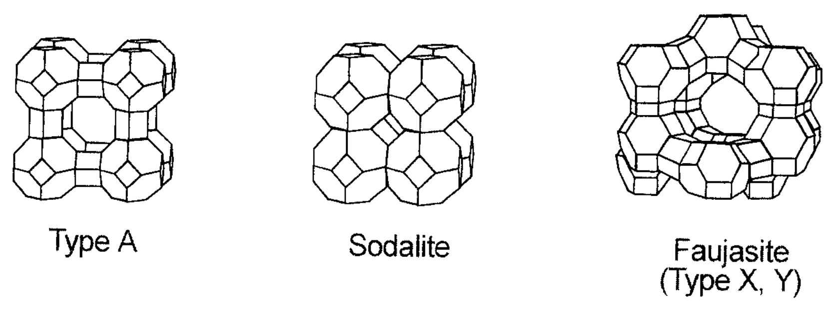


Figure 4-2. Sketches of zeolites.[3]
(Reprinted by permission of Chemical Engineering Progress, American Institute of Chemical Engineers.)

The main uses of molecular sieves have been to remove moisture from exhaust streams, to separate hydrocarbons in refining processes, and to remove nitrogen oxide compounds from air pollution sources. Because of the development of new synthetic zeolites, their applications are expanding into the volatile organic compound (VOC) control field. The surface areas of molecular sieves range from 590 to 700 m^2/gm.

Synthetic Polymers

Polymeric adsorbents are formed by crosslinking long chain polymers that have a variety of functional groups. The polymeric materials have a rigid microporous structure with surface areas of more than 1,000 m^2/gm.[4] The ash content is less than 0.01%.[4,5] The chemical structure of one commercial brand of synthetic polymer is shown in Figure 4-3.

These materials have very high adsorption capacities for selected organic compounds, and they can be regenerated more rapidly than activated carbon adsorbents. Regeneration can occur using hot air, hot nitrogen, steam, indirect contact heating, and microwaves. The main applications of this type of adsorbent are the control of organic compounds such as ketones, aldehydes, and reactive compounds that can undergo various chemical reactions on the surfaces of activated carbon.

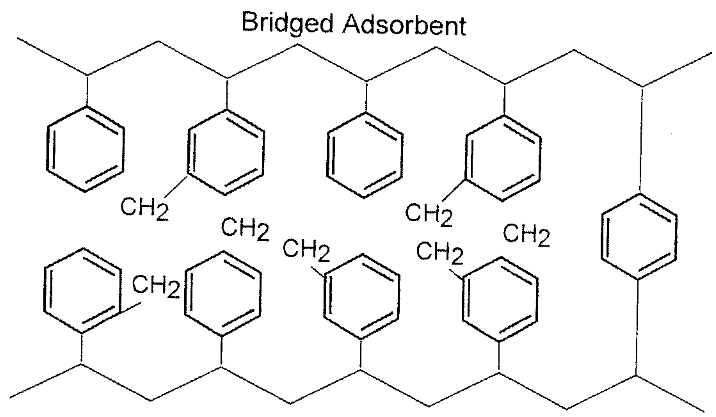


Figure 4-3. Example of a synthetic polymer.
(Reprinted courtesy of Dow Chemical, Inc.; Midland, Michigan.)

Polymeric adsorbents are also used for gas streams containing high water vapor concentrations (>50% relative humidity) because they are less prone to adsorb water vapor than conventional activated carbon adsorbents. The main limitation to the use of polymeric adsorbents is cost. These materials are more expensive than activated carbon and zeolite adsorbents.[4]

Silica Gel

Silica gels are made from sodium silicate. Sodium silicate is mixed with sulfuric acid, resulting in a jelly-like precipitant from which the name "gel" comes. This precipitant is then dried and roasted. Different grades can be produced depending on the processes used in manufacturing the gel. Silica gels have surface areas of approximately 750 m^2/gm. They are used primarily to remove moisture from exhaust streams. Silica gels are ineffective at temperatures above 500°F (260°C).

Activated Alumina (Aluminum Oxides)

Activated alumina is an amorphous form of aluminum oxide manufactured by heating aluminum trihydrate in an inert atmosphere to produce a porous, high-surface-area adsorbent. The primary use of activated alumina is for drying gases and they are not commonly used in air pollution applications. The surface areas of activated alumina adsorbents can range from 2 to 300 m^2/gm.

Characteristics of Adsorbents

The physical properties of the adsorbent affect the adsorption capacity, adsorption rate, and pressure drop across the adsorbent bed. Table 4-1 summarizes these properties for the adsorbents discussed earlier.

Table 4-1. Physical properties of major types of adsorbents.

Adsorbent[2]	Internal Porosity (%)	Surface Area (m^2/gm)	Pore Volume (cm^3/gm)	Bulk Dry Density (gm/cm^3)	Mean Pore Diameter (Å)
Activated Carbon	55-75	600-1600	0.80-1.20	0.35-0.50	1500-2000
Activated Alumina	30-40	200-300	0.29-0.37	0.90-1.00	1800-2000
Zeolites (Molecular Sieves)	40-55	600-700	0.27-0.38	0.80	300-900
Synthetic Polymers[1]	- -	1080-1100	0.94-1.16	0.34-0.40	-

1. Data provided applied to Dow XUS -43493.02 and XUS-43502.01 adsorbents.[4]
2. Data on silica gels not available.

Because adsorption occurs at the gas-solid interface, the surface area available to the vapor molecules determines the effectiveness of the adsorbent. Generally, the larger the surface area, the higher the adsorbent's capacity is. However, the surface area must be available in certain pore sizes if it is to be effective as a vapor adsorber.

Dubinin[6] classified the pores in activated carbon as *micropores*, *macropores*, or *transitional pores*. Micropores have diameters of 10-100 Angstroms (Å; Angstrom = 1.0×10^{-10} meters) or less. Pores larger than 1,000 Å are considered macropores, and pores with diameters in the range of 100 to 1,000 Å are defined as transitional.

Many gaseous air pollutant molecules are in the 40 to 60 Angstrom size range. Thus, if a large portion of an adsorbent's surface area is associated with pores smaller than 60 Å, many contaminant molecules will be unable to reach these sites.

The large pores serve mainly as passageways to the smaller pores where the adsorption forces are stronger. These forces are strongest in pores that are smaller than approximately twice the size of the contaminant molecule where the molecules experience overlapping attraction of the closely-spaced walls.

Capillary condensation occurs when mulitiple layers of adsorbed contaminant molecules build up from both sides of the pore wall, totally packing the pore and condensing in it. This activity usually occurs only in the micropores. The amounts of contaminant removed increase because additional molecules condense on the surface of the liquid that has formed.

Adsorption Systems

Nonregenerative Adsorption Systems

Nonregenerative adsorption systems are manufactured in a wide variety of physical configurations. They usually consist of thin adsorbent beds, ranging in thickness from 0.5 to 4 inches (1 to 10 cm). These thin beds have low-pressure drops, normally below 0.25 in W.C. (0.06 kPa) depending on the bed thickness, gas velocity, and particle size of the adsorbent. Bed areas are sized to control the gas velocity through them from 20 to 60 ft/min (6 to 18 m/min). Service time for these adsorption units can range from six months for "heavy" odor concentrations to two years for trace concentrations or intermittent operations.[7] Nonregenerative adsorption systems are used mainly as air purification devices for small air flow streams such as offices and laboratory exhausts.

These thin bed adsorbers are flat, cylindrical, or pleated. The granules of activated carbon are retained by porous support material, usually perforated sheet metal. An adsorber system usually consists of a number of retainers or panels placed in one frame. Figure 4-4 shows a nine-panel, thin-bed adsorber. The panels are similar to home air filters except that they contain activated carbon as the filter instead of fiberglass.

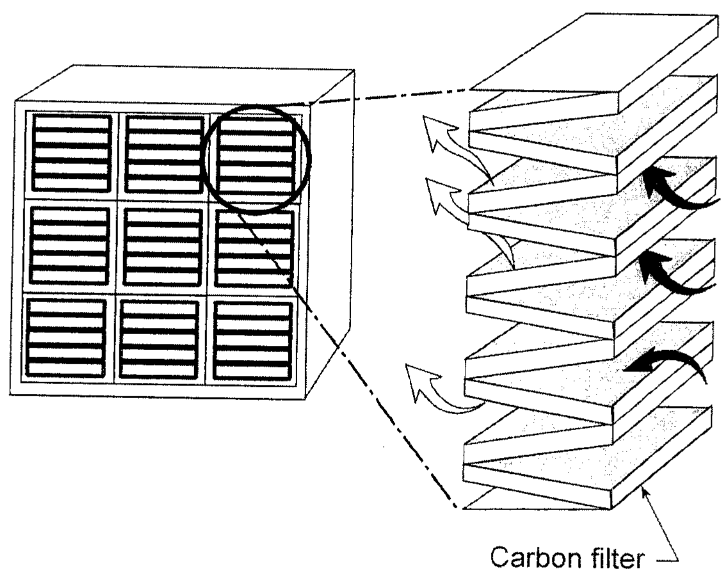


Figure 4-4. Thin-bed adsorber — nine-cell system.

The pleated cell adsorber (Figure 4-5) consists of one continuous retainer of activated carbon, rather than individual panels. Cylindrical canisters (Figure 4-5) are usually small units designed to handle low flow rates of approximately 25 ACFM (0.7 m^3/min). Cylindrical canisters are made of the same materials as the panel and pleated adsorbers, but their shape is round rather than square. Panel and pleated beds are dimensionally about the same size, normally 2 ft by 2 ft (0.6

m by 0.6 m). Flat panel beds are sized to handle higher exhaust flow rates of approximately 2,000 ACFM (57 m^3/min), while pleated beds are limited to flow rates of 1,000 ACFM (28 m^3/min).

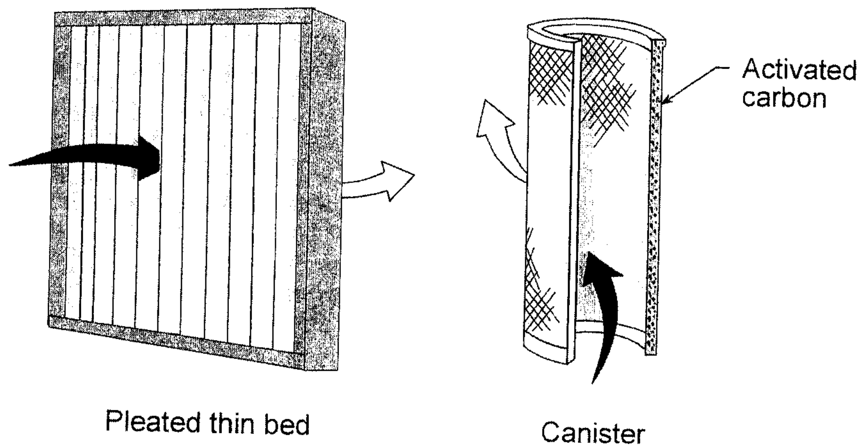


Figure 4-5. Nonregenerative adsorbers.

Thick-bed nonregenerative systems are also available. One system, shown in Figure 4-6, is essentially a 55-gallon drum. The bottom is filled with a material such as gravel to support a bed of activated carbon weighing approximately 150 lb_m (70 kg). These units are used to treat small flow rates of 100 ACFM (2.8 m^3/min) from laboratory hoods, chemical storage tank vents, or chemical reactors.

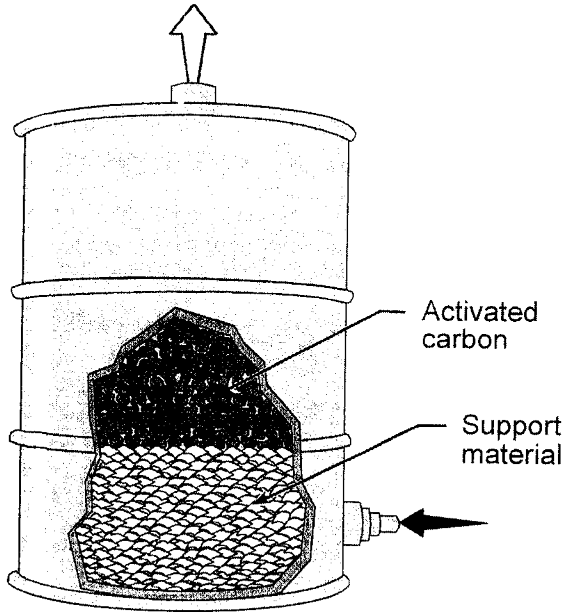


Figure 4-6. Thick bed nonregenerative adsorber.

A flowchart of a simple system containing a small-scale nonregenerative adsorber is shown in Figure 4-7. Solvent-laden air (SLA) is generated in a laboratory hood or small-scale industrial process that is almost entirely enclosed in a hood. A centrifugal fan discharges the SLA at positive pressure first to a particulate filter and then into the activated carbon panels or barrels. The cleaned gas stream is then exhausted directly to the atmosphere.

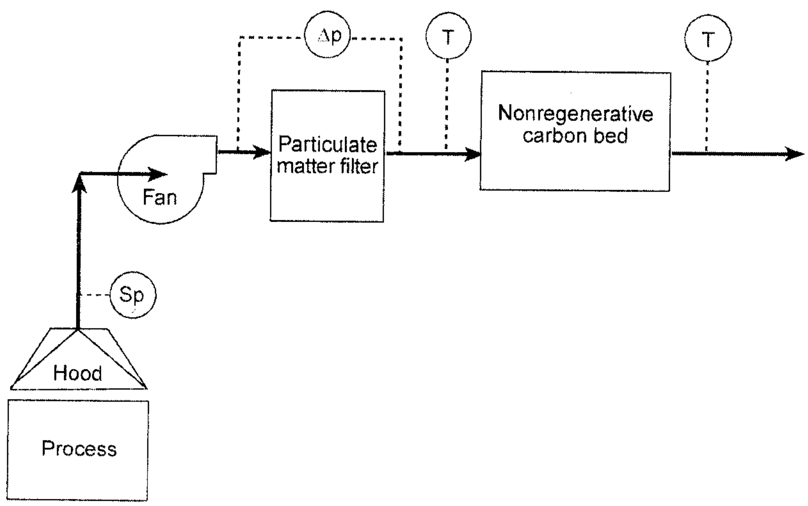


Figure 4-7. Flowchart of a simple nonregenerative adsorber.

The instrumentation on these systems is usually limited. In some cases, gas stream temperature monitors (usually dial-type thermometers) are mounted in the inlet and outlet ducts of the activated carbon panel units or barrels. An increase in the inlet temperature from the design or baseline levels indicates that the service life of the activated carbon may be reduced. An increase in the outlet temperature compared to the inlet temperature may indicate that liquid droplets of solvent are being captured in the bed and increasing the bed temperature. High outlet temperatures must be monitored to prevent fires.

Particulate filters may be used to prevent the accumulation of dusts, fibers, and other debris from plugging the passages through the activated carbon bed. The static pressure drop across these filters provides an indication of filter overloading, which reduces gas flow through the system.

Due to the physical scale of the nonregenerative systems, it is uneconomical to include outlet organic vapor concentration monitors since these instruments can cost several times the total cost of the control system. Accordingly, with these small systems, there is no direct indication that the unit is approaching saturation.

Regenerative Adsorption Systems – Fixed-Bed Designs

Large regenerative adsorption systems can be categorized as *fixed*, *moving*, or *fluidized* beds. The name refers to the manner in which the gas stream and adsorbent are brought into contact. The choice of a particular system depends on the pollutants to be controlled and the recovery requirements.

Fixed carbon adsorption beds are commonly used to control a variety of organic vapors and are often regenerated by low-pressure steam. They are best used when the liquid organic is immiscible with water when steam is used during the regeneration step. Relatively pure organic liquids may be recovered by condensing the regeneration exhaust and separating the water and the organic based on different densities.

Fixed-bed adsorption systems usually involve multiple beds. One or more beds treat the process exhaust, while the other beds are either being regenerated or cooled. A flowchart of a typical two-bed adsorption system is shown in Figure 4-8.

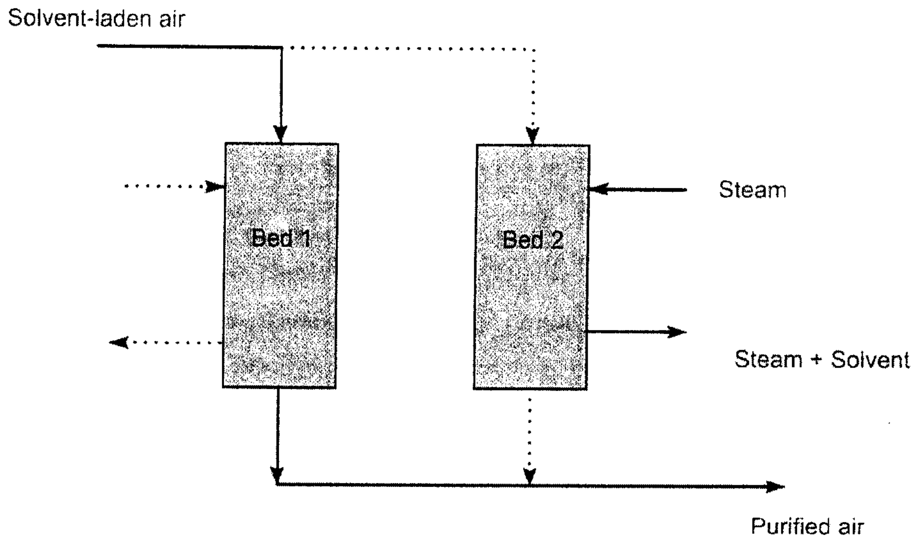


Figure 4-8. Two-bed adsorption system.

As shown, solvent-laden air enters Bed 1, which is in the adsorption mode. Gas flow is usually in the downward direction to avoid possible entrainment of carbon particles that might occur in the upflow mode. Solvent is adsorbed while purified air is discharged to the atmosphere. At the same time Bed 2 is in the regeneration mode. Steam is fed to Bed 2 and steam plus solvent exit the bed and are fed to the solvent recovery system. The functions of the two beds are switched periodically by opening and closing appropriate dampers. The switching may be based either upon a time cycle or when the adsorption bed approaches saturation and the solvent concentration in the purified air increases to some predetermined level. Three or more beds may be required if the duration of the adsorption and regeneration/cooling cycles cannot be matched.

A more complete three-bed system is shown in Figure 4-9. The SLA stream is first pretreated to remove any solid particles that could plug the carbon bed and prevent proper contact between the gas stream and the adsorbent bed. The solvent-laden air stream is often passed through an indirect heat exchanger (cold water tubes) to lower the gas temperature to the range of 60°F to 100°F (15°C to 40°C) where adsorption efficiency and adsorbent service life are both optimum. The pretreated gas stream then enters one of the parallel vessels that house the adsorbent beds. In Figure 4-9 we can imagine that the top bed is in the adsorption mode while the second bed is being regenerated and the third is cooling prior to its next adsorption phase. The steam plus regenerated solvent pass first to a condenser and, if the steam and solvent are immiscible, to a decanter where separation occurs due to density differences in the two phases. If the solvent and steam are miscible, distillation may be required for separation.

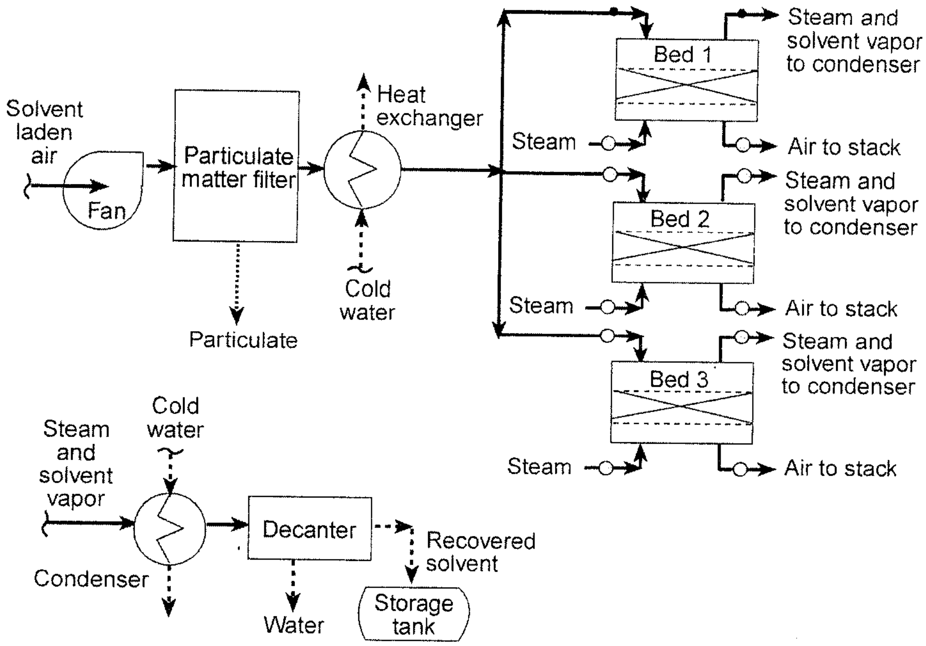


Figure 4-9. Multi-bed, fixed-bed-type adsorption system.

Regenerative fixed carbon beds are usually from 1 to 4 ft (0.3 to 1.2 m) thick. The maximum adsorbent depth of 4 ft (1.2 m) is based on pressure drop considerations.[6] Superficial gas velocities through the adsorber range from 20 to 100 ft/min (6 to 30 m/min). Pressure drops normally range from 3 to 15 in. W.C. (0.75 to 3.75 kPa), depending on the gas velocity, bed depth, and carbon pellet size.[3] A cutaway sketch of a fixed-bed adsorber vessel is shown in Figure 4-10.

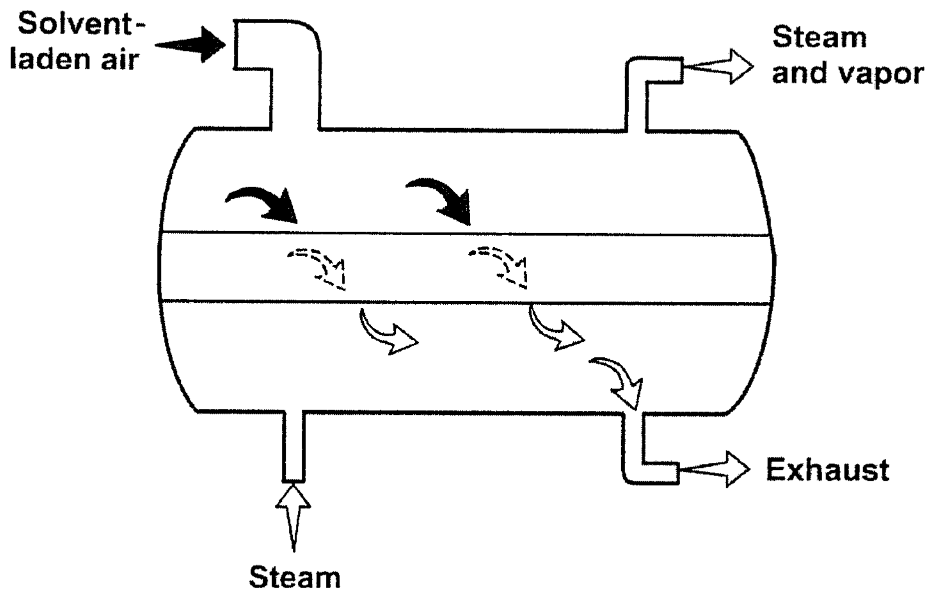


Figure 4-10. Cutaway sketch of horizontal adsorber vessel.

Adsorbers of this type are manufactured as a package system capable of handling flow rates up to 400,000 ACFM (11,500 m^3/min). Larger units must be engineered and fabricated for the specific application.

Some fixed-bed adsorbers have been designed recently with "multi-pass" capability in order to increase the solvent vapor removal efficiency. The last adsorber vessel that has been regenerated is placed as a second stage[9] by using a series of dampers and connecting ductwork. The air stream passing out of the first adsorber is then directed through this second vessel in order to remove the solvent vapors that penetrated the first unit. This approach is also called *series/parallel.*

Two-chamber, fixed-bed adsorbers have also been developed using carbon fiber adsorbent elements. The activated carbon is prepared as fiber-coated surfaces, a number of which are mounted in a single chamber. The carbon fiber is a thin layer of material with micropores leading directly from the adsorbent surface.[10] With the two-chamber design, one of the chambers is in adsorption mode, while the other is desorbed using hot steam. Because of the thin depth of the material, desorption times are shorter than those for the conventional deep-bed, carbon pellet designs. A diagram of a two-bed, carbon fiber adsorber is shown in Figure 4-11.

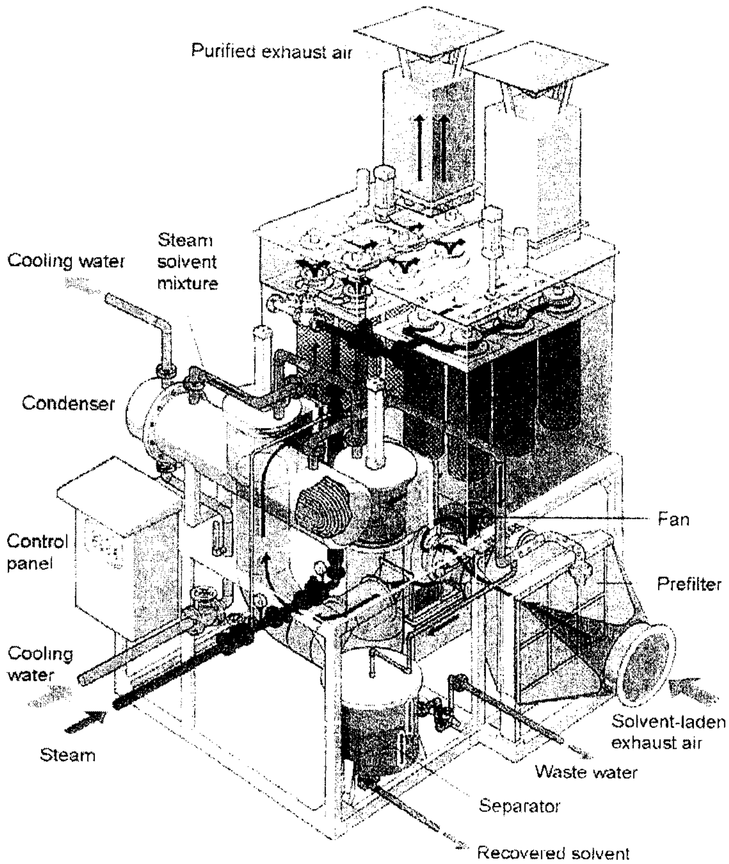


Figure 4-11. Carbon fiber system.
(Reprinted courtesy of Durr Industries, Inc.; Plymouth, Michigan.)

Regenerative Adsorption Systems – Moving-Bed Designs

Moving-bed systems can use a carbon bed more effectively than a fixed-bed system because the solvent-laden air stream passes only through the unsaturated portion of the carbon bed, reducing the distance the air stream travels through the bed; therefore, the static pressure drop is low.

One type of moving-bed adsorber is the rotary wheel zeolite adsorber, such as shown in Figure 4-12. The zeolite adsorbent is mounted in a vertically oriented wheel that rotates at a rate of approximately five revolutions per hour. Three quarters of the wheel are in adsorption service while one quarter is being desorbed using hot air. The desorbed gas stream has a VOC content that is concentrated by approximately a factor of 10 to 15 over the inlet level and a flow rate that is less than 10% of the inlet gas stream. Overall VOC adsorption efficiencies are in the range of 90% to 98%.

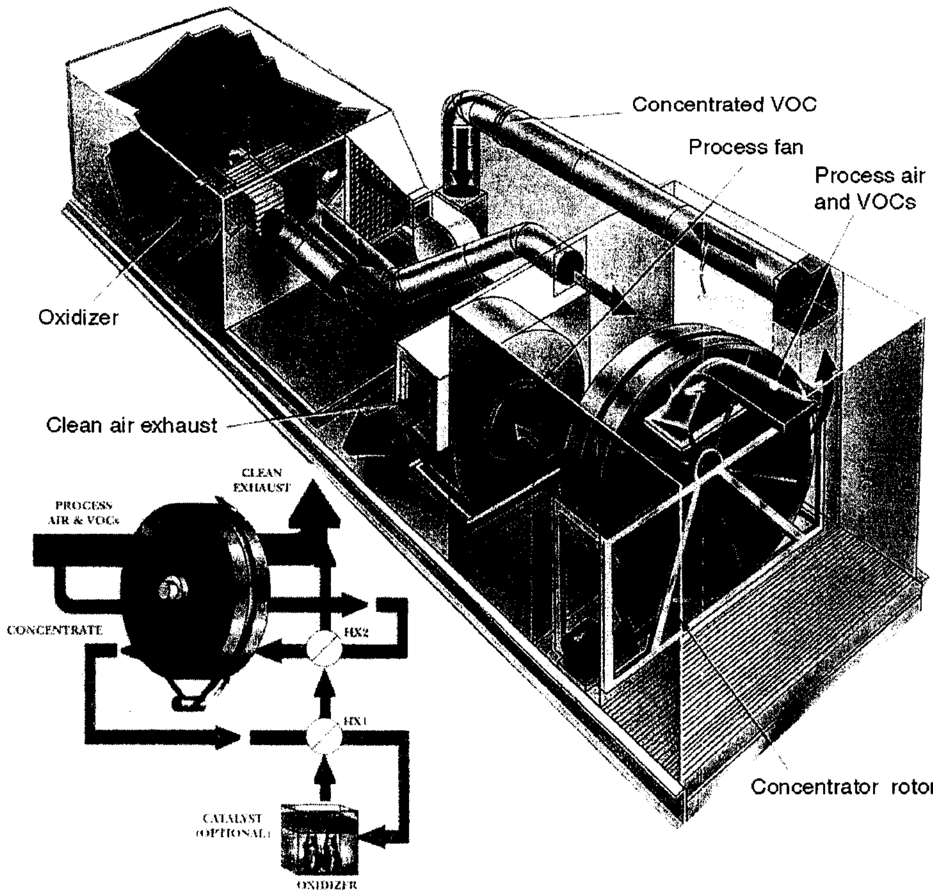


Figure 4-12. Rotary wheel zeolite adsorber.

Another type of moving-bed adsorber is the rotary carbon-fiber adsorber. This adsorber uses activated carbon-fiber paper prepared in a corrugated honeycomb arrangement (Figure 4-13a). The absorbent is mounted in a rotor that turns continuously at a speed of 1 to 9 revolutions per hour.[12] Desorption is accomplished using hot air that passes through the honeycomb as it rotates into position.

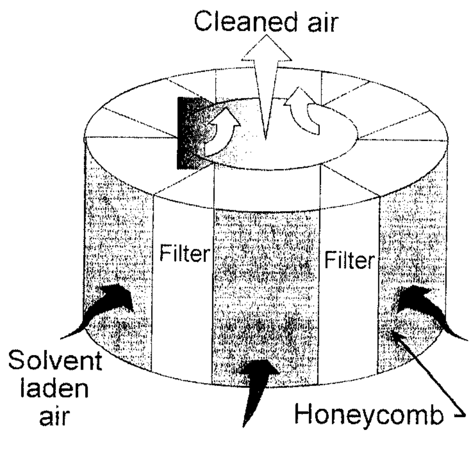


Figure 4-13a. Rotor for carbon-fiber system.

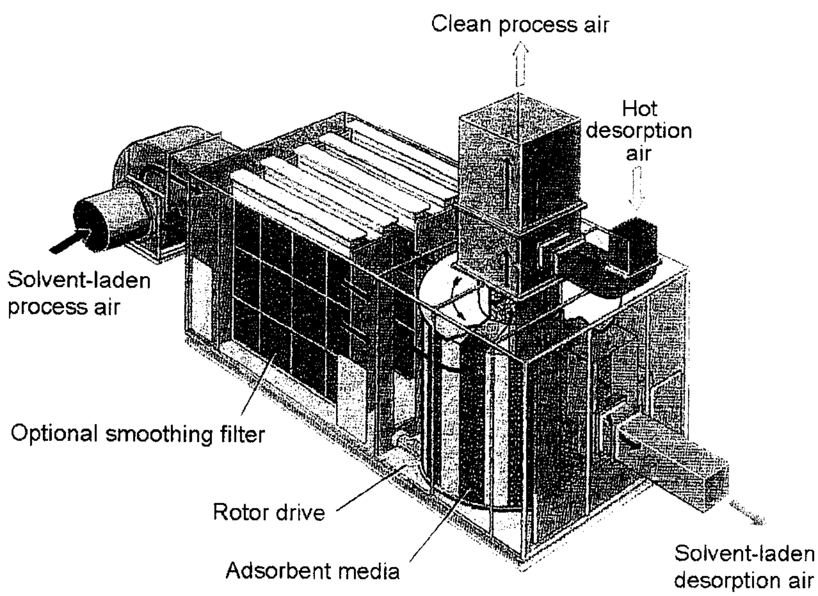


Figure 4-13b. Rotor system.
(Reprinted courtesy of Durr Industries, Inc.; Plymouth, Michigan.)

Adsorption and desorption are performed simultaneously on different sectors of the rotor. The desorbed solvent vapors are at concentrations of 5 to 15 times the inlet levels. Accordingly, the system is attractive for the pretreatment of dilute solvent-laden air streams prior to incineration. The carbon-fiber rotor system is shown in Figure 4-13b.

Regenerative Adsorption Systems – Fluidized-Bed Adsorbers

A fluidized bed system, shown in Figure 4-14, uses the motion of the solvent-laden gas stream to entrain adsorbent material and thereby facilitate good gas-solid contact. The VOC-laden gas stream is introduced at the bottom of the adsorber vessel and passes upward through the fluidized adsorbent with the purified gas exiting at the top. The adsorbent plus VOC is pneumatically conveyed to the desorption vessel for regeneration. Regeneration gas plus VOC exit from the top and are ready for further treatment. The regenerated adsorbent is then pneumatically conveyed back to the adsorption vessel. Because the adsorption and desorption processes are physically separate, organic contaminants can be concentrated by a factor of 10 to 50.

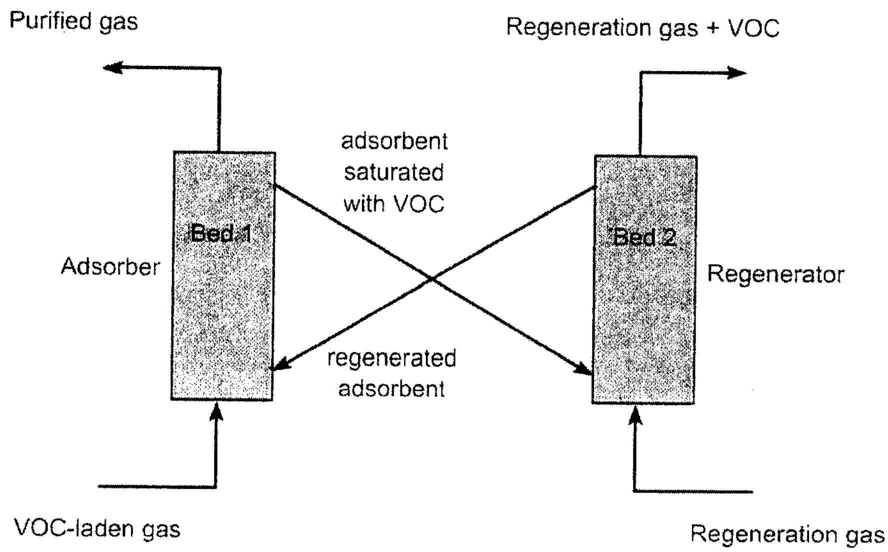


Figure 4-14. Fluidized bed adsorber/regenerator.

A system that consists of multiple fluidized beds is shown in Figure 4-15. VOC-laden gas enters at the bottom of the adsorber and passes upward through a series of beds. The adsorbent flows downward from bed to bed until it reaches the bottom. The saturated adsorbent is then transported pneumatically to the desorption vessel for regeneration. In this system regeneration is accomplished by indirect contact with hot gases from the oxidizer. The regenerated adsorbent is then transported back to the adsorption vessel while the desorbed VOC is destroyed in the oxidizer.

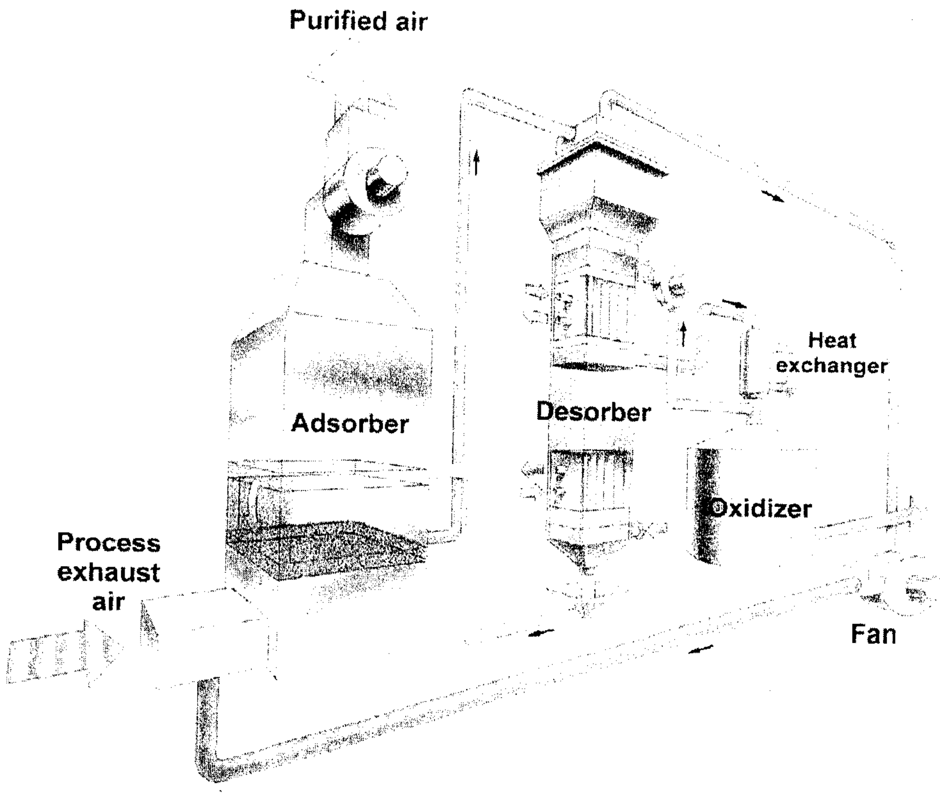


Figure 4-15. Fluidized-bed adsorber.
(Reprinted courtesy of Weatherly, Inc.; Atlanta, Georgia.)

Both the moving bed and fluidized bed systems provide continuous operation and more efficient utilization of the adsorbent. These systems can be used with either polymeric adsorbents or activated carbon adsorbents. It is necessary to use an adsorbent that can withstand the physical attrition inherent in the system. A "beaded" activated carbon that minimizes attrition loss has been developed. The beaded shape is inherently stronger and has better fluidity properties than granular carbon. This type of carbon has been used in a few installations and is reported to reduce the attrition loses to 2% to 5% per year.

4.2 Operating Principles

Adsorption Steps

Adsorption occurs in a series of three steps. In the first step, the contaminant is transferred from the bulk gas stream to the external surface of the adsorbent material. In the second step, the contaminant molecule diffuses from the relatively small area of the external surface (a few square meters per gram) into the macropores, transitional pores, and micropores within each adsorbent. Most adsorption occurs in the micropores because the majority of available surface area is there (hundreds of square meters per gram). In the third step, the contaminant molecule adsorbs to the surface in the pore. Figure 4-16 illustrates this overall mass transfer, diffusion, and adsorption process.

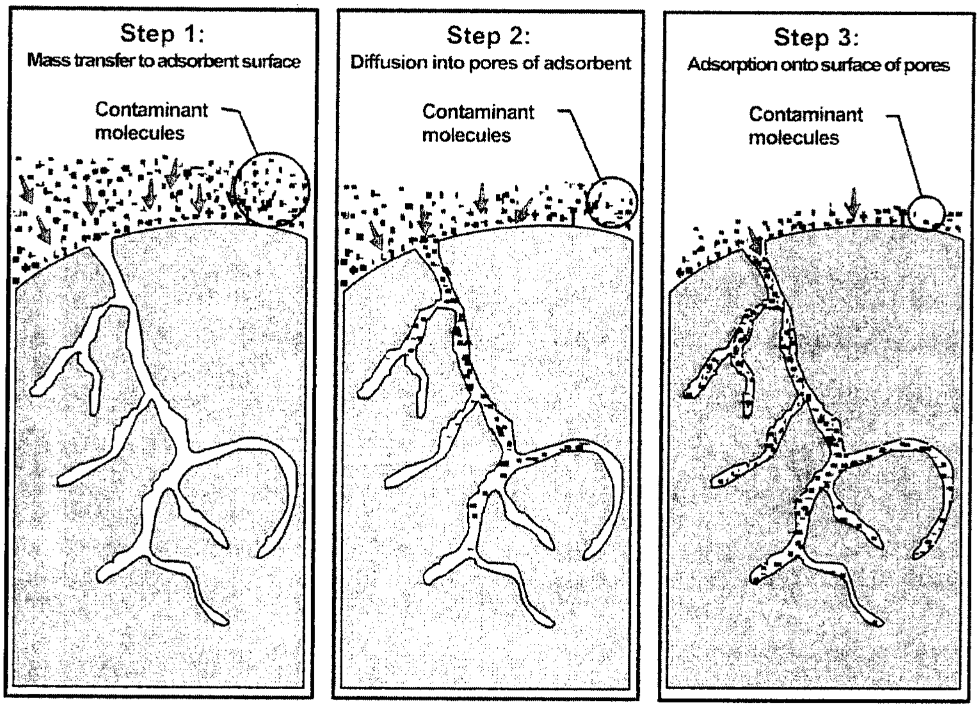


Figure 4-16. Adsorption steps.

Steps 1 and 2 occur because of the concentration difference between the bulk gas stream passing through the adsorbent and the gas near the surface of the adsorbent. Step 3 is the actual physical bonding between the molecule and the adsorbent surface. This step normally occurs more rapidly than steps 1 and 2.

Adsorption Forces

The adsorption process is classified as either *physical* or *chemical*. The basic difference is the strength in which the gas molecule is bonded to the adsorbent. In physical adsorption, the gas molecule is held to the solid surface by weak forces of intermolecular cohesion. The chemical nature of the adsorbed gas remains unchanged; therefore, physical adsorption is a readily reversible process. In chemical adsorption a strong chemical bond is formed between the gas molecule and adsorbent. Chemical adsorption, or chemisorptions, is not easily reversed.

Physical Adsorption

The forces active in physical adsorption are electrostatic in nature and occur under suitable conditions in most gas-solid systems. These forces are present in all states of matter: gas, liquid, and solid. They are the same forces of attraction that cause gases to condense and deviate from ideal behavior under extreme conditions. Physical adsorption is also referred to as van der Waals' adsorption. Because of van der Waals' forces, physical adsorption can form multiple layers of adsorbate molecules, one on top of another.

The electrostatic effect that produces van der Waals' forces depends on the polarity of both the gas and solid molecules. Molecules in any state are either polar or nonpolar depending on their chemical structure. Polar substances exhibit a separation of positive and negative charges within the compound, which is referred to as a *permanent dipole*. Water is a prime example of a polar substance. Nonpolar substances have both their positive and negative charges in one center so they have no permanent dipole. Most organic compounds are nonpolar because of their symmetry.

Physical adsorption can result from three different effects: orientation, dispersion, or induction (Figure 4-17). For polar molecules, attraction occurs because of the *orientation effect*. The negative charge of one molecule is attracted to the positive charge of the other. An example of this type of adsorption is the removal of water vapor (polar) from an exhaust stream using silica gel (polar).

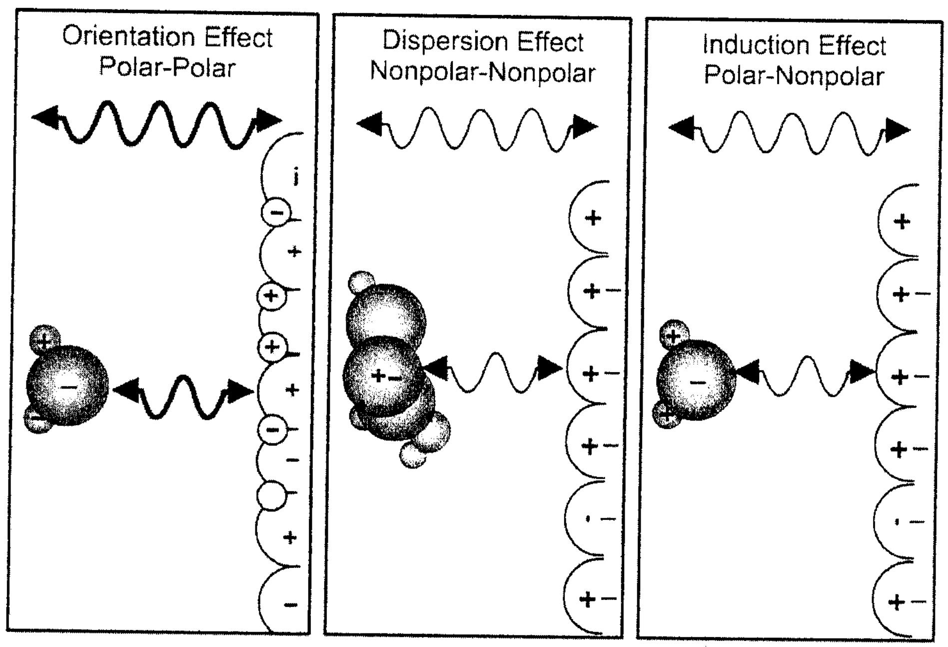


Figure 4-17. Physical forces causing adsorption.

The adsorption of a nonpolar gas molecule onto a nonpolar surface is accounted for by the *dispersion effect*. This effect is based on the fact that although nonpolar substances do not possess a permanent dipole, they do have a fluctuating or oscillating dipole. Fluctuating dipoles are a result of momentary changes in electron distribution around the atomic nuclei. In a nonpolar substance, when two fluctuating dipoles come close to one another, their total energy decreases, and they fluctuate in phase with each other. This is the origin of the name *dispersion effect*. The adsorption of organic vapors onto activated carbon is an example of nonpolar molecular attraction.

The attraction between a molecule with a permanent dipole (polar molecule) and a nonpolar molecule is caused by the *induction effect*. A molecule with a permanent dipole can induce polarity into a nonpolar molecule when they come in close contact. The energy of this effect is determined by the polarizability of the nonpolar molecules. The induction effect is, however, small when compared to the orientation or dispersion effects. Therefore, adsorption systems use polar adsorbents to remove polar contaminants. This ensures that the inter-molecular forces of attraction between the gas and solid will be greater than those between similar molecules in the gas phase.

Chemisorption

Chemical adsorption (chemisorption) results from a chemical interaction between the gas and the solid. The gas is held to the surface of the adsorbate by the formation of a chemical bond. Adsorbents used in chemisorption can be either pure substances or chemicals deposited on an inert carrier material. One example of the former is the use of pure iron oxide chips to adsorb hydrogen sulfide gas. An example of the latter is the use of activated carbon that has been impregnated with potassium iodide to remove mercury vapors.

All adsorption processes are exothermic whether adsorption occurs from chemical or physical forces. The fast-moving gas molecules lose kinetic energy when adsorbed on the solid, which results in the liberation of heat.

In chemisorption, the heat of adsorption is comparable to the heat evolved from an exothermic chemical reaction, usually over 10 Kcal/gm moles. The heat given off by physical adsorption is much lower, approximately 0.1 Kcal/gm mole, which is comparable to the heat of condensation. Molecules that are chemisorbed are very difficult (and, in some cases, impossible) to remove from the adsorbent surface. Either increasing the operating temperature or reducing the pressure of the adsorbent bed can usually remove physically adsorbed molecules. Chemisorption stops when all the active sites on the surface of the adsorbent have reacted, forming only a monolayer of adsorbate molecules on the surface. Multilayers of adsorbed molecules can often be formed in physisorption. While the physical adsorption rate decreases with increasing temperature, the chemisorption rate increases with increasing temperature. Chemisorption is a highly selective process. A gas molecule must be capable of forming a chemical bond with the adsorbent surface for chemisorption to occur. Physisorption, in contrast, is a more general phenomenon. For these reasons physical adsorption is more desirable for air pollution control. A summary of the characteristics of physical versus chemical adsorption is presented in Table 4-2.

Table 4-2. Summary of the characteristics of chemisorption and physical adsorption.

Chemisorption	Physical Adsorption
Releases high heat, 10 Kcal/gm mole	Releases low heat, 0.1 Kcal/gm mole
Forms a chemical compound	Gas retained by dipolar interaction
Desorption difficult	Desorption easy
Adsorbate recovery impossible	Adsorbate recovery easy

Adsorption-Capacity Relationships

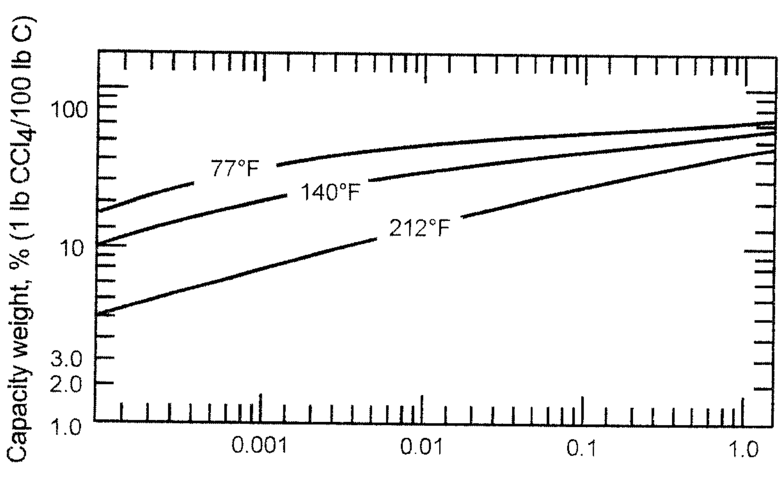
Most available data on adsorption systems are determined at equilibrium conditions. The equilibrium capacity is the maximum amount of vapor that can be adsorbed at a given set of operating conditions. Adsorption equilibrium is the set of conditions at which the number of molecules arriving on the surface of the adsorbent equals the number of molecules leaving. The adsorbent bed becomes "saturated with vapors" and cannot remove any more vapors from the exhaust stream. Although a number of variables affect adsorption capacity, gas temperature and pressure are the two most important.

Adsorption equilibrium data may be presented in three forms: isotherm at constant temperature, isobar at constant pressure, and isostere at constant amount of vapor adsorbed.

Isotherm

The most common and useful method of presenting adsorption equilibrium data is the adsorption isotherm, a plot of the adsorbent capacity versus the partial pressure of the adsorbate at a constant temperature. Figure 4-18 is an example of an adsorption isotherm for carbon tetrachloride on one specific activated carbon. Adsorption capacity may be presented in many different of units, with pounds of adsorbate per 100 pounds of adsorbent being typical. Data of this type are used to estimate the size of adsorption systems as demonstrated in Problem 4-1.

Attempts have been made to develop generalized equations to predict adsorption equilibrium from physical data. This is difficult because adsorption isotherms take many shapes depending on the forces involved. Isotherms can be concave upward, concave downward, or "S" shaped. To date, most of the theories agree with data only for specific adsorbate-adsorbent systems and are valid over limited concentration ranges.



Source: Adapted from Technical Bulletin, Calgon Corp.

Figure 4-18. Adsorption isotherm for carbon tetrachloride on one specific commercial activated carbon adsorbent product.

Problem 4-1

A dry cleaning process exhausts a 15,000 SCFM air stream containing 680-ppm carbon tetrachloride. Given Figure 4-18, and assuming that the exhaust stream is at approximately 140°F and 14.7 psia, determine the saturation capacity of the activated carbon.

Solution:

Step 1. In the gas phase, the mole fraction (y) is equal to the ppm divided by 10^6.

$$y = 680 \text{ ppm} = 0.00068$$

The partial pressure is the product of the total pressure and the mole fraction.

$$P^* = yP = (0.00068)(14.7 \text{ psia}) = 0.010 \text{ psia}$$

Step 2. From Figure 4-17, at a partial pressure of 0.01 psia and a temperature of 140°F, the carbon capacity is read as approximately 45 lb CCl_4/ 100 lb C, or 45%. This is also equal to 45 gm CCl_4/100 gm C.

It must be noted that, in practical applications, adsorbers use more carbon than is required at saturation to ensure that uncaptured vapors are not exhausted to the atmosphere. Problem 4-2, presented later in this chapter, illustrates this point.

Isostere

The isostere is a plot of the natural log of the pressure versus the reciprocal of absolute temperature (ln[p] vs. 1/T) at a constant amount of vapor adsorbed. Adsorption isostere lines are straight for most adsorbate-adsorbent systems. Figure 4-19 shows an isosteres for the adsorption of H_2S gas onto molecular sieves. The isostere is important because the slope of the isostere corresponds to the differential heat of adsorption. The total or integral heat of adsorption is determined by integration over the total quantity of material adsorbed.

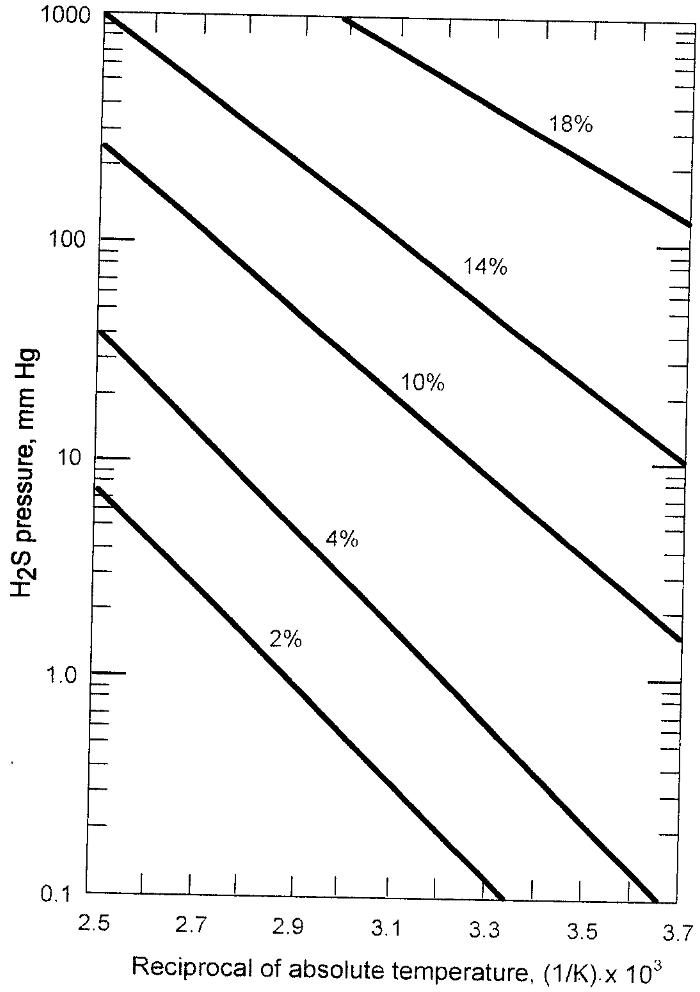


Figure 4-19. Adsorption isosteres of H_2S on 13X molecular sieve (loading in % H_2S by weight).

Isobar

The isobar is a plot of the amount of vapor adsorbed versus temperature at a constant partial pressure of the adsorbate. Figure 4-20 shows an isobar for the adsorption of benzene vapors on an activated carbon.

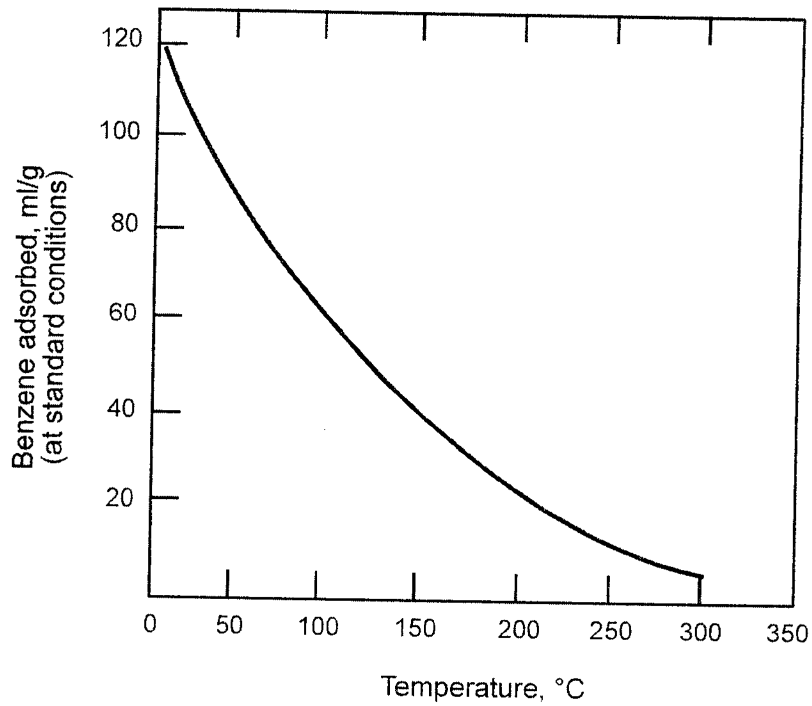


Figure 4-20. Adsorption isobar for benzene on an activated carbon ($P_{benzene}$ = 10.0 mm Hg).

Note that the capacity units in this isobar are ml benzene/gm C. Also note that the amount adsorbed decreases with increasing temperature. This is always the case for physical adsorption.

Because the isotherm, isostere, and isobar for a given adsorbate-adsorbent system are developed at equilibrium conditions, they are mutally dependent. By determining one, such as the isotherm, the other two relationships can be determined. In the design of an air pollution control system, the adsorption isotherm is by far the most commonly used equilibrium relationship.

4.3 Adsorption System Performance

Applicability

Nonregenerative Systems

Nonregenerative systems are applicable to a wide variety of small, low-concentration organic vapor sources. As a very approximate guideline, organic compounds having molecular weights greater than 50 and/or boiling points greater than 68°F (20°C) can be adsorbed. Because these units are not regenerated, it is often possible to use them up to 50% of the saturation level indicated by the applicable adsorption isotherm. This is generally a higher adsorbent utilization than is practical in regenerative systems. Accordingly, nonregenerative units can have a relatively long service life despite the limited quantity of adsorbent present.

Regenerative Systems

Conventional regenerative carbon bed adsorbers are used primarily for the removal and/or recovery of organic compounds having molecular weights between approximately 50 and 200.[10] These compounds usually have boiling points between 68°F and 350°F (20°C to approximately 175°C).[10] Very high molecular weight, high boiling point compounds have such a strong affinity for the adsorbent that it is impractical to desorb these materials.

Table 4-3 presents examples of organic compounds suitable for regenerative carbon adsorption. This is not a complete list because carbon adsorption is used for a wide variety of organic compounds. Other compounds, such as those listed in Table 4-4, are not suitable for regenerative adsorption because of their reactivity or high molecular weights and boiling temperatures.

Table 4-3. Examples of organic compounds suitable for carbon adsorption.

Organic Compound	Boiling Point °F (°C)	Molecular Weight	Water Soluble	Flammable Liquid	Lower Explosive Limit, % Vol
Aliphatic					
Heptane	209 (98.4)	100.2	No	Yes	1.20
Hexane	156 (68.7)	86.2	No	Yes	1.20
Pentane	97 (36.1)	72.2	No	Yes	1.50
Naptha	288 (142)	-	No	Yes	0.92
Mineral Spirits	381 (194)	-	No	Yes	<1.00
Stoddard Solvent	379 (193)	-	No	Yes	1.10
Aromatic					
Benzene	176 (80.0)	78.1	No	Yes	1.40
Toluene	231 (110.6)	92.1	No	Yes	1.40
Xylene	292 (144.4)	106.2	No	Yes	1.00
Ester					
Butyl Acetate	259 (126.1)	116.2	No	Yes	7.60
Ethyl Acetate	171 (77.2)	88.1	Yes	Yes	2.50
Halogenated					
Carbon Tetrachloride	170 (76.7)	153.8	No	No	N.F.
Ethylene Dichloride	210 (98.9)	85.0	No	Yes	6.20
Methylene Chloride	104 (40.0)	84.9	Yes	No	N.F.
Perchloroethylene	250 (121.1)	165.8	No	No	N.F.
Trichloroethylene	189 (87.2)	131.4	No	No	N.F.
Trichloroethane	165 (73.9)	133.4	No	No	N.F.
Ketones					
Acetone	133 (56.1)	58.1	Yes	Yes	2.60
Diacetone Alcohol	293 (145.0)	116.2	Yes	Yes	-
Methyl Ethyl Ketone	174 (78.9)	72.1	Yes	Yes	1.80
Methyl Isobutyl Ketone	237 (113.9)	100.2	Yes	Yes	1.20
Alcohols					
Butyl Alcohol	241 (116.1)	74.1	Yes	Yes	1.40
Ethanol	165 (73.9)	46.1	Yes	Yes	4.30
Propyl Alcohol	205 (96.1)	60.1	Yes	Yes	2.10

Table 4-4. Organic compounds not usually suitable for carbon adsorption.	
Reactive Compounds	**High Boilers**
Organic acids	Plasticizers
Aldehydes	Resins
Monomers (some)	Long Chain HCs ($+C_{14}$)
Ketones (some)	Glycols, Phenols, Amines

Adsorption Capacity

Three important terms are used in actual systems to describe the capacity of the adsorbent bed, measured, for example, in pounds of vapor per pound of adsorbent.

- *Breakthrough capacity* is defined as the capacity of the bed at the time where unadsorbed vapor begins to be emitted.
- *Saturation capacity* (or equilibrium capacity) is the maximum amount of vapor that can be adsorbed per unit weight of carbon. This is the capacity read from the adsorption isotherms.
- *Working capacity* is a fraction of the saturation capacity, often in the range from 0.1 to 0.5 of the saturation capacity, that is used for design purposes. Smaller working capacities increase the amount of carbon required. The designer selects the appropriate fraction for individual systems by balancing the cost of carbon and adsorber operation versus preventing breakthrough.

It is generally uneconomical to desorb all vapor during the regeneration cycle. The small amount of residual vapor left in the bed is referred to as the *heel,* which accounts for a large portion of the difference between the saturation capacity and the working capacity. In some cases, the working capacity can be estimated by assuming that it is equal to the saturation capacity minus the heel.[16] Problem 4-2 illustrates one method of estimating the working capacity. In all of the examples in this course, a design factor of 0.25 of the saturation capacity is used. This is the same as assuming that the working amount of carbon is four times the amount required at saturation.

Problem 4-2

A dry cleaning process exhausts a 15,000 SCFM air stream containing 680 ppm carbon tetrachloride. Based on Figure 4-17 and gas stream conditions of 140°F and 14.7 psia, estimate the amount of carbon required if the adsorber operates on a four-hour cycle. Note that saturation capacity of the activated carbon is 45% by weight. The molecular weight of CCl_4 is 154. Use a working capacity of 25% of the saturation capacity.

Solution:

Step 1. Compute the flow rate of CCl_4.

$$Q_{CCl_4} = 15{,}000\ \text{SCFM} \times 0.00068 = 10.2\ \text{SCFM}\ CCl_4$$

Convert to pounds per hour:

$$\frac{10.2\ \text{ft}^3}{\text{min}} \times \frac{\text{lb mole}}{385.4\ \text{ft}^3} \times \frac{154\ \text{lb}_m}{\text{lb mole}} \times \frac{60\ \text{min}}{\text{hour}} = 245\ \text{lbm}\ CCl_4/\text{hour}$$

For a four-hour cycle:

$$4 \times 245 = 980\ \text{lb}_m\ CCl_4$$

Step 2. The amount of activated carbon (at saturation) required is:

$$980\ \text{lb}_m\ CCL_4 \times \frac{100\ \text{lb}_m\ \text{carbon}}{30\ \text{lb}_m\ CCL_4} = 3270\ \text{lb}_m\ \text{activated carbon}$$

The actual amount of activated carbon required can be estimated by multiplying the amount needed at saturation by four (based on the working capacity of 25% of the saturation capacity).

$$4 \times 2178 = 8710\ \text{lb}_m\ \text{carbon per four-hour cycle per adsorber}$$

Note: This gives only a rough estimate of the amount of carbon needed. Actual working capacity may be 25% to 75% of the saturation capacity.

Factors Affecting Adsorption System Performance

A number of factors or system variables that influence the performance of a physical adsorption system are discussed in the following sections.

Temperature

The capacity of an adsorbent decreases as the temperature of the system increases, as illustrated in Figure 4-21. As the temperature increases, the vapor pressure of the adsorbate increases, raising the energy level of the adsorbed molecules. Adsorbed molecules now have sufficient energy to overcome the van der Waals' attraction and migrate back to the gas phase. Molecules already in the gas phase tend to stay there due to their high vapor pressure. As a general rule, adsorber temperatures are kept below 130°F (54°C) to ensure adequate bed capacities. Temperatures above this limit can be avoided by cooling the exhaust stream to be treated.

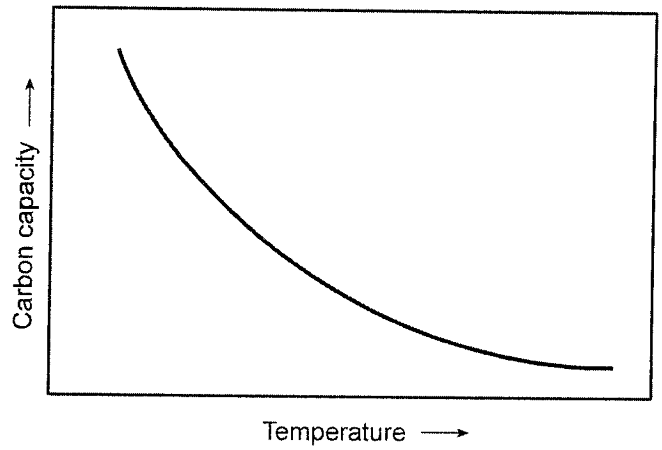


Figure 4-21. Carbon capacity versus gas stream temperature.

Adsorption is an exothermic process with the heat released for physical adsorption approximately equal to the heat of condensation. At low concentrations (below 1,000 ppm), the heat release is minimal and is quickly dissipated by the gas flowing through the bed. At higher concentrations (e.g., 5,000 ppm), the bed temperature can increase, thus causing the adsorption capacity to decrease. In addition, granular carbon is a good insulator that inhibits heat dissipation from the interior of the bed. In some cases, especially ketone recovery, the temperature rise can cause auto-ignition of the carbon bed.

Pressure

Adsorption capacity increases with an increase in the partial pressure of the vapor, which is proportional to the total pressure of the system. Any increase in pressure will increase the adsorption capacity. The increase in capacity occurs because of a decrease in the mean free path of vapor at higher pressures. Simply, the molecules are packed more tightly together. More molecules have a chance to "hit" the available adsorption sites, increasing the number of molecules adsorbed.

Gas Velocity

The gas velocity through the adsorber bed determines the contact or residence time between the gas stream and adsorbent. The residence time directly affects capture efficiency. The lower the gas velocity (the longer the contact time) through the adsorbent bed, the greater is the probability of a contaminant molecule reaching an available site. In order to achieve 90% or more capture efficiency, most carbon adsorption systems are designed for a maximum gas velocity of 100 ft/min (30 m/min) through the adsorber. A lower limit of at least 20 ft/min (6 m/min) is maintained to avoid flow problems such as channeling.

Gas velocity through the adsorber is determined by dividing the gas volumetric flow rate by the cross-sectional area of the adsorber. By specifying the gas velocity through the adsorber, the cross-sectional area is also specified.

Problem 4-3

A regenerative carbon bed system has three beds in parallel, each having a gas flow rate of 9,000 SCFM, a gas temperature of 100°F, and a gas pressure of +4 in. W.C. The barometric pressure is 30.3 in. Hg. What is the minimum cross-sectional area of each bed if the gas velocity must be maintained below 100 feet per minute?

Solution:

Step 1. Calculate the absolute static pressure.

$$SP_{\text{absolute}} = (4 \text{ in. W.C.}) + 30.3 \text{ in.Hg}\left(\frac{407 \text{ in. W.C.}}{29.92 \text{ in.Hg}}\right) = 416 \text{ in. W.C.}$$

Step 2. Calculate the gas flow rate in ACFM.

$$\text{ACFM} = 9{,}000 \text{ SCFM}\left(\frac{460°\text{R} + 100°\text{F}}{528°\text{R}}\right)\left(\frac{407 \text{ in. W.C.}}{416 \text{ in. W.C.}}\right) = 9{,}340 \text{ ACFM}$$

Step 3. Calculate the minimum cross-sectional area of the bed to maintain a maximum of 100 ft/min.

$$\text{Velocity} = \left(\frac{\text{Gas flow rate in ACFM}}{\text{Area}}\right)$$

$$100 \text{ ft/min} = \left(\frac{9{,}340 \text{ ACFM}}{\text{Area}}\right)$$

$$\text{Area} = 93.4 \text{ ft}^2$$

Increasing the gas flow rate through the absorber increases the pressure drop. Within the above stated maximum and minimum flow rates, the allowable pressure drop usually dictates the required tower cross-sectional area and flow rate. The pressure drop across the bed also depends on the depth of adsorbent.

Humidity

As stated previously, activated carbon will preferentially adsorb nonpolar hydrocarbons over polar water vapor. The water vapor molecules in the exhaust stream exhibit stronger attractions for each other rather than the adsorbent. However, at high relative humidity the number of water molecules increases to the extent that they begin to compete with the hydrocarbon molecules for active adsorption sites, thus reducing the capacity and efficiency of the adsorption system.

Exhaust streams with humidities greater than 50% may require installation of additional equipment. Condensers to remove a portion of the water are one solution. Dilution air containing less moisture than the process stream has also been used. The contaminant stream may also be heated to reduce the humidity as long as the increase in temperature does not greatly affect adsorption efficiency. Additional adsorbent can be added to help offset the reduced efficiency.

Bed Depth

Providing a sufficient depth of adsorbent is very important in achieving efficient VOC removal due to the fact that adsorption rate is not infinitely fast. There are practical minimum and maximum limits to the bed depth.

The minimum depth is based primarily on the length of the mass transfer zone (MTZ) that, at fixed conditions such as temperature, partial pressure, and gas velocity, is related to the rate of adsorption. The MTZ is the volume of the bed where mass transfer occurs at any one time. The MTZ starts on the gas inlet side of the bed and moves through the bed as illustrated in Figure 4-22. The actual length of the MTZ remains fairly constant throughout the adsorption step. As long as the leading edge of the MTZ is above the bed outlet, the effluent concentration c_2 remains very low, because that portion of the bed in front of the MTZ has not yet been exposed to VOC.

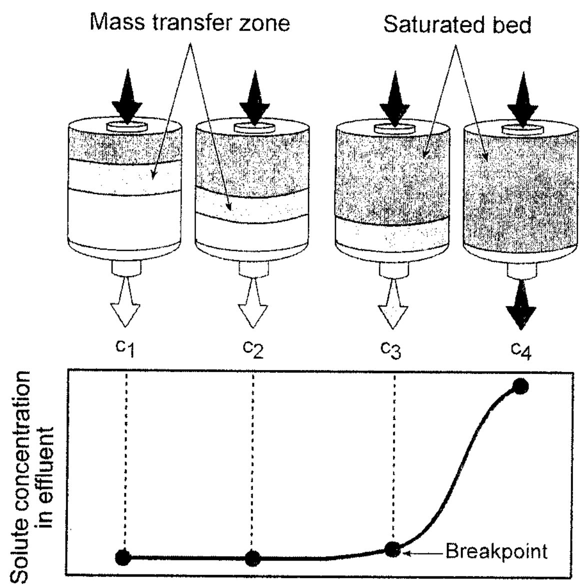


Figure 4-22. Mass transfer zone.

When the leading edge of the MTZ reaches the outlet of the bed, the concentration of contaminant in the effluent suddenly begins to rise. This is referred to as the breakthrough point. If the contaminated gas stream is not switched to a newly regenerated bed, the concentration of contaminant in the outlet will quickly rise until it equals the initial concentration, c_4.

If the adsorber bed depth is shorter than the required MTZ, breakthrough will occur almost immediately, rendering the system ineffective. Estimating the

MTZ is important in determining the minimum bed depth.

Estimating the length of the MTZ is difficult because it depends on six separate factors: (1) adsorbent particle size, (2) gas velocity, (3) adsorbate concentration, (4) fluid properties of the gas stream, (5) temperature of the system, and (6) pressure of the system. The MTZ can be estimated from experimental data using Equation 4-1.[17] To obtain the necessary data, vendors will usually test a small portion of the exhaust stream on a pilot adsorber column, operating at several different bed depths.

(Eq. 4-1)

$$MTZ = \frac{1}{1 - X_S} D \left(1 - \frac{C_B}{C_S}\right)$$

Where:

MTZ	= length of MTZ (meters)
X_S	= degree of saturation in the MTZ (%), usually assumed to be 50%
D	= bed depth (meters)
C_B	= breakthrough capacity (%)
C_S	= saturation capacity (%)

In the absence of experimental data, empirical factors are often used to estimate the MTZ.

Actual bed depths are usually several times longer than the length of the MTZ. The additional bed depth allows for adequate cycle times. Equation 4-1 can be rearranged to solve for breakthrough capacity for a fixed bed depth.

(Eq. 4-2)

$$C_B = \frac{(X_S)(C_S)(MTZ) + C_S(D - MTZ)}{D}$$

Often the actual adsorbent depth is fixed by the maximum allowable static pressure drop across the bed. Pressure drop data for typical carbons are presented in Figure 4-23.[16] The pressure drop per meter of bed depth is plotted versus the gas velocity with the carbon mesh size as a parameter. From the figure, an adsorber with a flow rate of 80 ft/min (24 m/min) using 4x10 mesh carbon will have a pressure drop of approximately 6 in. W.C. per foot (1.5 kPa per meter) of bed depth. Therefore, if the total pressure drop across the bed is limited to 18 in. W.C. (4.5 kPa), the total bed depth should not exceed 3 ft (0.9 m).

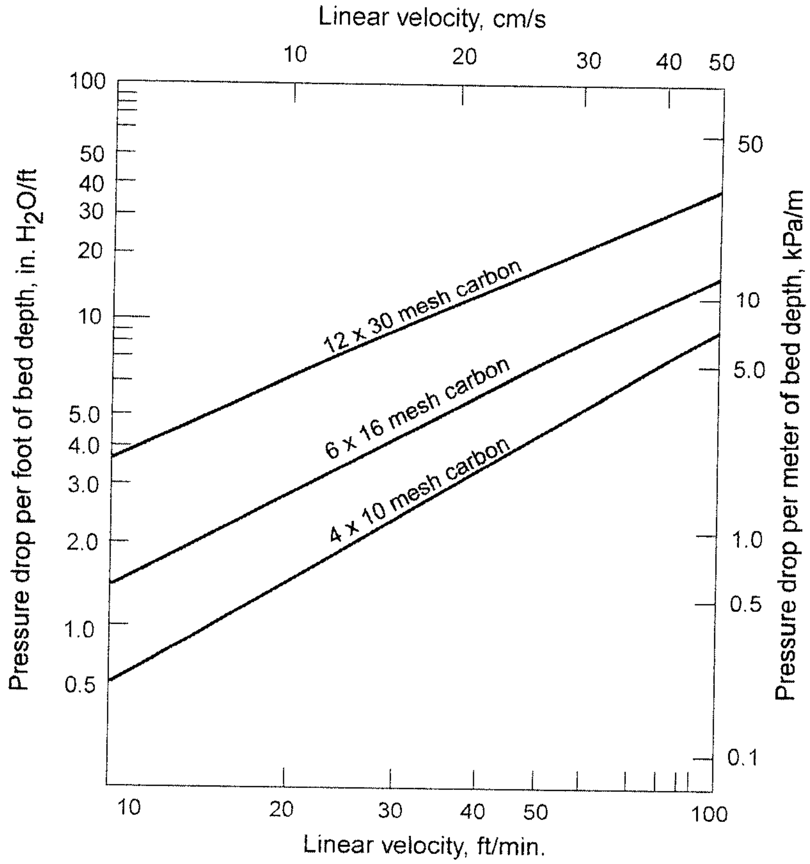


Figure 4-23. Pressure drop versus gas velocity through a deep bed granular carbon.

Contaminants

Particulate matter, organic compounds that have high boiling points, and entrained liquid droplets can also reduce adsorber efficiency if present in the gas stream.

Dust or lint greater than 3 micrometers in size can cover the surface of the adsorbent and reduce the surface area available to the gas molecule for adsorption. Covering active adsorption sites by an inert material is referred to as "blinding" or "deactivation." To avoid this situation, almost all industrial adsorption systems are equipped with some type of upstream particulate matter removal device.

High boiling point and high molecular weight compounds have such an affinity for the carbon that it is extremely difficult to remove them by standard desorption practices. These compounds also tend to react chemically on the carbon surface, forming solids or polymerization products that are extremely difficult to desorb. Loss of carbon activity in this manner is termed *chemical deactivation*.

Entrained liquid droplets can also cause operational problems. Liquid droplets that are non-adsorbing can act the same way as particulate matter by covering the surface and blinding the bed. Liquid adsorbate droplets result in high heats of adsorption, thereby increasing the temperature and decreasing the adsorption capacity. In the limit, the liquid organic droplets carried over from the process can cause bed fires from the released heat. An entrainment separator may be required when liquid droplets are present.

Adsorbent Regeneration Methods

Periodic replacement or regeneration of the adsorbent bed is mandatory in order to maintain continuous operation. When the adsorbate concentration is high, and/or the cycle time is short (less than 12 hours), replacement of the adsorbent is not feasible, and in situ regeneration is required. Regeneration is accomplished by reversing the adsorption process, usually increasing the temperature or decreasing the pressure. Four methods are used commercially for regeneration.

Thermal Swing

The bed is heated so that the adsorption capacity is reduced. The adsorbate leaves the surface of the carbon and is removed from the vessel by a stream of purge gas. Cooling must be provided before the subsequent adsorption cycle begins. Steam regeneration is a common example of thermal swing regeneration.

Pressure Swing

The pressure is lowered at a constant temperature to reduce the adsorbent capacity.

Inert Purge Gas Stripping

Purging with an inert gas reduces the partial pressure of the contaminant in the gas phase, reversing the concentration driving force. Molecules desorb from the surface into the gas stream.

Displacement Cycle

The adsorbates is displaced by a compound that is preferentially adsorbed. This method is usually a last resort for situations in which the adsorbate is both valuable and heat sensitive and in which pressure swing regeneration is ineffective.[7]

Thermal Swing —Steam Stripping

Steam stripping is the most common desorption technique because it is simple and relatively inexpensive. There are several additional advantages to using steam for desorption.

- A low steam temperature of 230°F (110°C) is sufficient to desorb most adsorbates of interest without damaging the carbon.
- Steam readily condenses in the adsorber bed, releasing its (the steam's) heat of condensation and aiding in desorption.
- Immiscible organic compounds can be easily separated by condensation

and decantation. Miscible compounds will require condensation followed by distillation.

- Residual moisture in the bed can be removed easily by a stream of cool, dry air (either pure or process-effluent).
- Steam is a more concentrated source of heat than hot air and is effective in raising the temperature of the adsorber bed quickly. Steam also avoids the potential fire hazard associated with air.

The amount of steam required for regeneration depends on the adsorbate and the adsorbate loading of the bed. The longer a carbon bed is steamed, the more adsorbate will be desorbed. It is usually not cost-effective to try to desorb all of the adsorbate. Acceptable working capacities can be achieved by using less steam and leaving a small portion of adsorbate in the bed (the heel). During the initial heating period, only a small amount of organic is desorbed because a fixed amount of steam is first required to raise the temperature of the bed to the desorption temperature. As the bed temperatue increases, the rate of desorption increases until a plateau is reached. The plateau represents the optimum steam requirement, usually in the range of 0.25 to 0.35 pound of steam/pound of carbon.[18] The steam is usually supplied at pressures ranging from 3 to 15 psig, and steam usage can range anywhere from 0.3 to 10 pounds of steam per pound of solvent removed.

Some disadvantages are associated with steam regeneration:

- The aqueous effluent from the condenser can pose a water pollution problem unless the condensate is sent to a wastewater treatment facility.
- Some organic compounds may hydrolyze or form corrosive solutions in the presence of water. Corrosive substances can greatly reduce the life of the adsorption equipment unless expensive corrosive resistant materials are used.
- A hot, wet carbon bed will not effectively remove organic vapors. The bed will need to be cooled and dried to ensure adequate removal efficiencies at the beginning of a subsequent cycle.

Pressure Swing - Vacuum Desorption

Pressure swing or vacuum desorption has one primary advantage over thermal (steam) desorption. Desorption is accomplished by a change in pressure rather than temperature, so the time required to heat and cool the carbon bed is avoided. Thus pressure swing allows the bed to be in the adsorption mode for a greater fraction of the total cycle time. Smaller units may also be used because there is no increase in air volume due to heating of the bed. Both of these conditions allow for higher throughputs or smaller adsorber designs than can be accommodated by thermal swing desorption systems. Importantly, the desorbed vapors can be condensed directly, thus avoiding the need for additional downstream processing equipment, such as decanters or distillation columns.

The principle disadvantages of a pure pressure swing cycle are its high operating and construction costs. A vacuum system is required, unless the adsorber is initially operated at elevated pressures so that the pressure swing can be accomplished by reducing the vessel to atmospheric pressures. In vacuum systems, the adsorber vessel and valving must be constructed of materials capable of withstanding vacuums of 28 in. Hg. Vacuum systems operating cyclically may require more operating attention than other regeneration systems. To be effective, pressure regeneration systems must operate so that a small decrease in pressure will result in a drastic shift in the direction of mass transfer.

Problem 4-4

A solvent degreaser is designed to recover toluene from an 8,000 ACFM air stream at 80°F (27°C) and atmospheric pressure. The company is planning to use a two-bed carbon adsorption system with a cycle time of 4 hours. The average concentration of toluene is 2,400 ppm. Given the adsorption isotherm for toluene (Figure 4-24), and the additional operational data given below, estimate the following:

- The amount of carbon required for a 4-hour operating cycle (operating time between desorption steps).
- The square feet of cross-sectional area required based on a 100 ft/min maximum velocity.
- The depth of the carbon bed.

Given: Molecular weight of toluene = 92.1
Activated carbon density = (30 lb_m/ft^3)

Solution:

Step 1. First calculate the toluene flow rate.

$$(8{,}000 \text{ ACFM})\frac{528°R}{540°R} = 7{,}820 \text{ SCFM}$$

$$(7{,}820 \text{ SCFM})\left(\frac{\text{lb moles total}}{385.4 \text{ scf}}\right)\left(\frac{0.0024 \text{ lb moles toluene}}{\text{lb moles total}}\right)$$

$= 0.0487$ lb moles toluene/min

The mass flow rate of toluene is:

$(0.0487 \text{ lb mole/min})(92.1 \text{ lb}_m/\text{lb mole}) = 4.49 \text{ lb}_m/\text{min}$

Step 2. To determine the saturation capacity of the carbon, calculate the partial pressure of toluene at the adsorption conditions.

$$p^* = yP = \left(\frac{2400 \text{ ppm}}{1{,}000{,}000}\right)(14.7 \text{ psia}) = 0.0353 \text{ psia}$$

From Figure 4-24, the saturation capacity of the carbon is 45% or 45 pounds toluene per 100 pounds of carbon at 0.0353 psia.

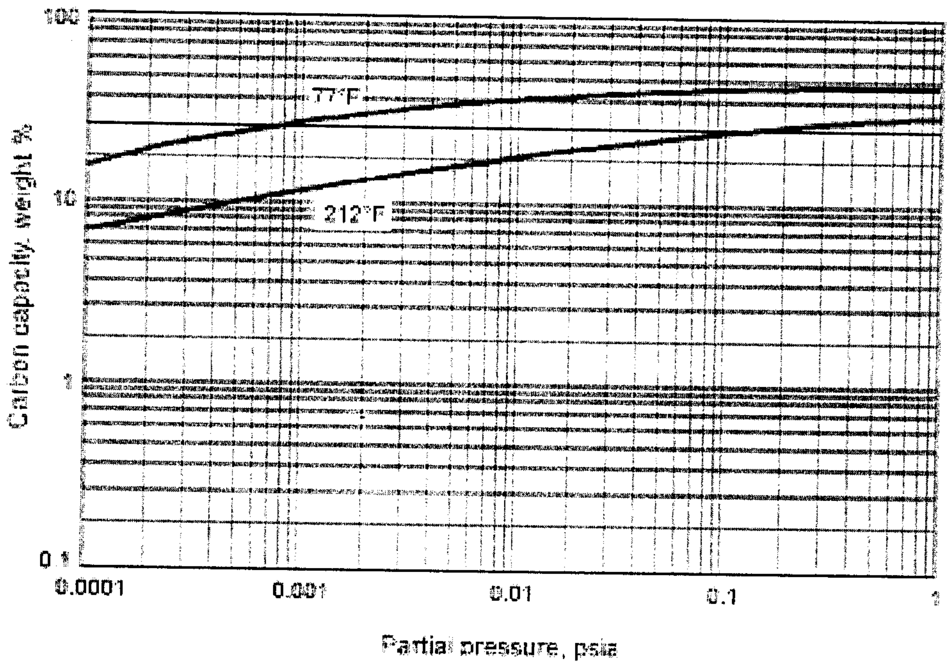


Figure 4-24. Toluene isotherm.

Step 3. The amount of carbon at saturation for a 4-hour cycle is:

$$\left(4.49\,\frac{\text{lb}_m\ \text{toluene}}{\text{min}}\right)\left(\frac{60\ \text{min}}{\text{hr}}\right)\left(\frac{100\ \text{lb}_m\ \text{carbon}}{38\ \text{lb}_m\ \text{toluene}}\right)\left(4\,\frac{\text{hr}}{\text{cycle}}\right)$$

$= 2{,}390\ \text{lb}_m$ of carbon (at saturation)

The working charge of carbon can be estimated by multiplying the saturation capacity by four. Therefore, the working charge is:

$(4)(2{,}390\ \text{lb}_m$ of carbon$) = 9{,}680\ \text{lb}_m$ of carbon for a 4-hour cycle

The cross-sectional area of the bed is the volumetric flow rate divided by the allowable velocity of 100 ft/min through the adsorber.

The required cross-sectional area is:

$$A = \frac{Q}{\text{Maximum Velocity}} = \frac{8{,}000\ \text{ACF/min}}{100\ \text{ft/min}} = 80\ \text{ft}^2$$

Step 4. Estimate the bed depth.

Each bed of the proposed two-bed system would have to handle the 8,000 ACFM gas flow rate because one bed would be in desorption mode a portion of the operating time.

At a carbon density of 30 lb_m/ft^3, the bed depth would be:

Vol. carbon = 9,680 lb_m carbon/(30 lb_m/ft^3) = 320 ft^3
Bed depth = 320 ft^3/80 ft^2 = 4 ft

This bed depth may result in excessively high pressure drop, so it may be preferable to use a larger vessel and a lower gas velocity. The required cross-sectional area is recalculated below using an average velocity of 60 ft/min rather than the 100 ft/min value used earlier in this problem.

$$A = \frac{Q}{\text{Maximum Velocity}} = \frac{8{,}000 \text{ acf/min}}{60 \text{ ft/min}} = 133 \text{ ft}^2$$

The bed depth for this modified approach would be:

320 ft^3/133 ft^2 = 2.4 ft

4.4 Performance Monitoring

The factors that contribute to premature organic breakthrough in a large fixed-bed, regenerative system or a large nonregenerative system are relatively similar. The problems include but are not limited to the following:

- Corrosion and subsequent collapse of the pellet beds
- Infrequent desorption
- Loss of adsorptive capacity due to high boiling point compounds
- Plugging of activated carbon pellet beds due to particulate matter
- Physical deterioration of the activated carbon pellets or carbon fiber materials
- Increased operating temperature
- Increased organic vapor concentration

A conventional regenerative deep, fixed-bed system will be used to illustrate the techniques available to evaluate performance and to identify the problems listed above. Although the techniques are relatively similar for all types of fixed-bed systems, some small-scale fixed-bed units will not have all of the on-site instruments that are economically reasonable for the large installations.

The example fixed-bed system flowchart is shown in Figure 4-25. This shows three adsorber beds in parallel. The SLA stream from the process equipment is discharged by the centrifugal fan through a particulate matter filter and an indirect heat exchanger into the top of the on-line adsorber vessel. Low-pressure steam is used to desorb the organic vapors from the off-line adsorber vessel. The typical types of instruments present on a large-scale system are shown in this flowchart.

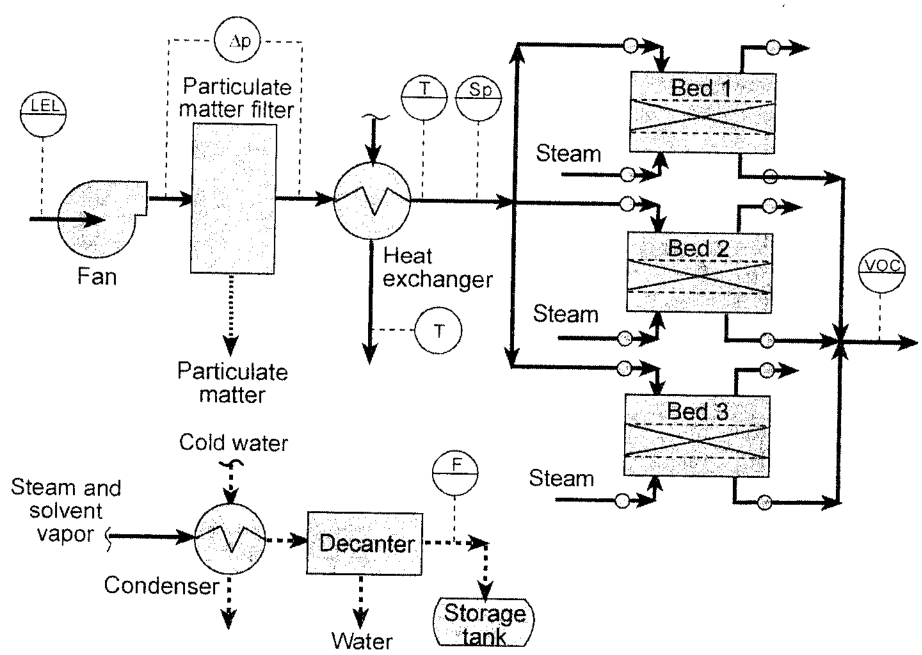


Figure 4-25. Flowchart of a three-bed (deep bed) absorber.

A control room or control panel for the adsorber system is usually located in an area close to the adsorber vessels. One or more storage tanks are usually also close to the system.

Outlet VOC Concentration Monitor

The most direct measure of the performance of the adsorber is provided by the outlet VOC concentration monitor. This instrument draws a sample gas stream from the outlet of each bed on a frequent basis. Common types of instruments include photoionization and flame ionization detectors (FID). The outlet concentrations are determined and recorded on a data acquisition system (DAS) or strip chart recorder at the control panel for the adsorber system. Premature breakthrough or other improper operation will be indicated by high outlet concentration.

It should be noted that these instruments provide an accurate indication of the outlet concentration only when they are calibrated for the specific organic compound, or compounds, present in the gas stream. The instruments are usually calibrated using a readily-available organic compound such as methane, propane, n-hexane, or 1,3 butadiene that can be prepared in a stable form at relatively high concentrations (100 to 10,000 ppm). Stable gas samples are much more difficult to prepare for compounds such as toluene, halogenated organics, and ketones. When calibration gases such as methane, propane, or 1,3 butadiene are used for calibration, the instrument reading is only a qualitative indicator of performance. However, instrument readings above baseline levels for the unit are a clear indication of adsorber performance problems.

The accuracy of the VOC data should be checked regularly. The instruments should be calibrated on a daily basis using gas cylinders. Calibration gas is usually injected near the sample port on each adsorber bed (Figure 4-26) so that the integrity of the sample line to the instrument can be confirmed. A variety of problems in these sample lines can lead to lower-than-actual organic vapor concentration readings; these include:

- VOC outlet monitor sample line problems
- Air infiltration due to leaking connections or corroded tubing
- Adsorption and absorption along the tubing walls due to low surface temperatures and water condensation
- Reduced sample gas flow rates due to partial plugging of the tubing (primarily affects flame ionization detectors)
- Inoperative valves controlling sample gas flow from each adsorber vessel

The calibration frequencies and procedures for the instruments should be checked. A single point calibration and a zero check should be made on a daily basis. Outlet concentration data obtained since the last calibration period may be corrected for calibration drift and zero drift by computerized data acquisition systems.

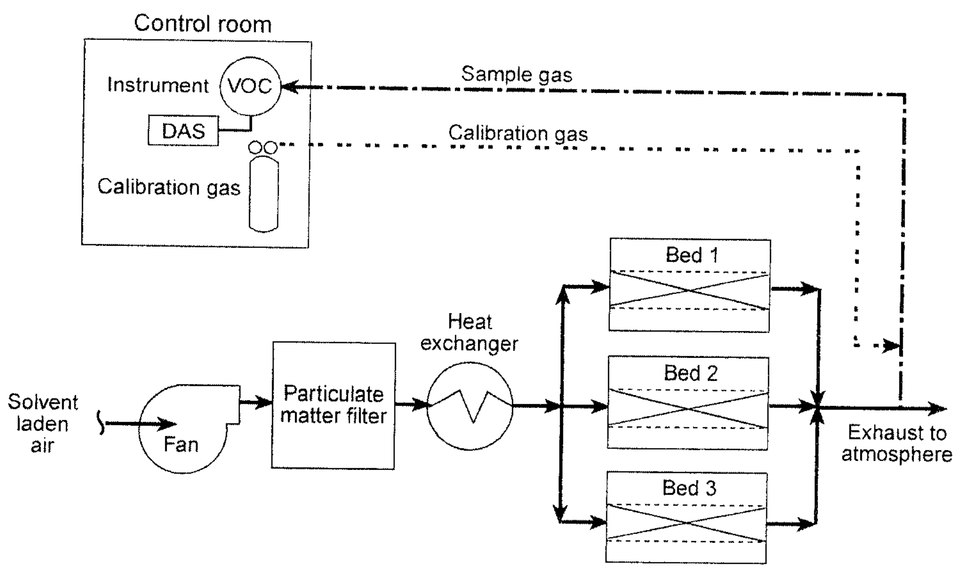


Figure 4-26. Calibration gas injection locations to check for sample line tubing problems.

Portable Organic Vapor Concentration Detectors

There are a variety of portable detectors (often termed portable VOC analyzers) that can be used for small-scale fixed-bed adsorbers where it is uneconomical to have permanently mounted instruments. The most common types include (1) flame ionization detectors, (2) catalytic combustion analyzers, and (3) photoionization detectors. All of these are battery-powered instruments that can be used to obtain a small gas sample and provide a qualitative indication of the total outlet VOC concentration. These instruments are subject to the same calibration gas limitations that affect the permanently mounted units on large-scale adsorber systems.

Flame Ionization Detectors

The flame ionization detector (FID) extracts 10 to 50 cc/min of the sample gas that is mixed with either pure hydrogen or a hydrogen/helium blend. The mixture is injected and combusted along with "clean" air in the FID. The organic compounds oxidized in the hydrogen flame form positive gas ions that are driven to a collector electrode in the burner chamber. The electrical current flowing through this electrode is amplified and provides an indication of the total mass of organic vapor in the sample gas stream. Any compounds that can be oxidized in the burner chamber can be detected, including essentially all organic compounds with the exception of low molecular weight, highly oxygenated or halogenated compounds, such as formaldehyde and carbon tetrachloride).

Catalytic Combustion Analyzers

The catalytic combustion analyzer is similar to the FID analyzer in that the organic compounds in the sample gas stream are entirely oxidized during the analysis. A small sample gas stream passes through a sintered metal detector that has a catalyst-coated wire. Oxidation of the organic compounds in this detector changes the electrical resistance of the coated wire. This change in resistance is converted to a current signal that is proportional to the total organic vapor concentration. This type of instrument responds to approximately the same types of compounds as the flame ionization detector; however, it is not quite as sensitive.

Photoionization Detectors

A photoionization detector (PID) pulls a sample gas stream through a small chamber where the organic compounds are irradiated with ultraviolet light. A small fraction of the organics is photoionized to form positive ions that are accumulated on an electrode creating a current proportional to the organic vapor concentration. The current is amplified to indicate the total organic vapor concentration. Unlike the flame ionization analyzer, the photoionization detector is essentially nondestructive. The sample gas stream passing through the instrument can be recovered in a sample gasbag and returned to a laboratory for more detailed analysis. Photoionization detectors can detect organic compounds with ionization potentials close to or below the ionization energy level of the lamp (e.g., 9.0, 10.0, 10.2, and 11.3 electron volts). Most organic compounds can be detected, including the highly oxygenated or halogenated compounds that cannot be measured by the flame ionization detector. Photoionization detectors are not useful for low molecular weight paraffinic compounds such as methane, propane, and butane, because these compounds have high ionization potentials. This is not a problem with respect to carbon adsorber evaluation, however, because these same compounds have very low affinity for activated carbon and are not controlled by these systems.

All three types of instruments can be used to measure the outlet VOC concentration from an adsorber. Because of the limited pump capacity of all three instrument types, the sample should be obtained from a positive pressure portion of the outlet duct. A single point measurement can usually be made, and the monitoring times are relatively short.

Organic vapor concentration measurements using portable VOC analyzers should be made near the end of the adsorption cycle. At this time, the outlet VOC concentration is at a maximum. The measurements must not be conducted when the adsorber is in the cooldown-purge cycle just prior to returning to adsorption service. During this period, the gas stream humidity is high and water droplets may be present. Moisture can damage the sensors of all three types of instruments.

Additional Monitoring Considerations

LEL *Inlet Monitor*

Adsorbers designed to operate with feed gas containing more than 10% to 25% of the LEL usually have an LEL monitor in the inlet duct to the adsorber system. The primary purpose of this instrument is to shut down the fan and other system components in the event that the inlet concentration increases above the safety limit.

This instrument can be used to provide a qualitative indication of changes in the inlet VOC concentration. Increased inlet concentrations could lead to organic vapor breakthrough unless the adsorption cycle time is decreased.

Gas Inlet Temperature

The gas inlet temperature is one of the most important variables affecting performance. Due to the weak physical forces involved in adsorption, increased gas temperatures result in substantially reduced adsorption capacity which leads to increased prebreakthrough concentrations and premature breakthrough. The inlet gas temperatures should be compared during the last several months to identify significant increases above baseline values. Furthermore, gas inlet temperatures above 100°F may indicate inadequate performance.

Adsorber Vessel Bed Static Pressure Drop

The static pressure drop across a fixed-bed adsorber is usually between 0.5 and 3.0 in. W.C. (0.1 and 0.75 kPa) per foot of bed. The static pressure drop across moving-bed adsorbers is usually considerably lower than the levels for the fixed-bed designs.

Changes from baseline pressure drop levels are usually associated with conditions that adversely affect performance. An increase in the static pressure drop (no change in the gas flow rate) can be caused by the accumulation of dust and particulate matter on the inlet side of the bed. Gas flow maldistribution will lead to decreased adsorption efficiency. A decrease in the static pressure drop may indicate partial or complete collapse of the fixed bed due to corrosion of the support grid.

Gas Flow Rate

Gas flow rates above the design range of the absorber vessel create a longer-than-anticipated MTZ. Breakthrough will occur if the MTZ reaches the outlet of the carbon bed before the adsorber is brought off-line for desorption. Usually, the maximum gas velocities through the bed are limited to less than 100 feet per minute. Increased gas flow rates are indicated by increased centrifugal fan motor currents, increased adsorber vessel pressure drop, and/or increased hood static pressures.

Decreased gas flow rates may also indicate performance problems. Increased fugitive emissions from the process equipment served by the adsorber could be due to reduced gas flow rates. This problem may be indicated by reduced fan motor current, decreased hood static pressure, decreased static pressure drop across the adsorber vessels, and/or decreased static pressure drop across the particulate matter filter.

Hood Static Pressure

The hood static pressure provides a useful indicator of the gas flow conditions at the pick-up point on the process equipment where the organic vapors are being released. The typical values of the hood static pressure range from approximately -0.3 in. W.C. (-0.075 kPa) to more than -2.0 in. W.C. (-0.5 kPa). If the hood static pressure becomes less negative (moves toward 0.0 in. W.C.), the gas flow rate has probably decreased, and fugitive emissions have probably increased.

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INSPECTION
RECORDS
MODIFIED
IN APRIL 20

ATTACHMENT 4

HAZARDOUS WASTE TANK SYSTEM DAILY INSPECTION LOG

(AS REQUIRED BY 4[illegible] [illegible]R 265.195)

BUSINESS NAME: AP[illegible]LLO INDU

BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: Aug.

YEAR: 2012

TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid? YES	NO	Is the system free of corrosion and evident damage? YES	NO	Are pipes, valves and pumps free of leaks and in good condition? YES	NO	Do open tanks have adequate free board? YES	NO	Is leak detection program/ equipment working? YES	NO	Any signs of wet spots, dead vegetation, etc. indicative of a release? YES	NO	Inspected by	Comments
1	✓		✓		✓		✓		✓			✓	[signature]	
2	✓		✓		✓		✓		✓			✓	[signature]	
3	✓		✓		✓		✓		✓			✓	[signature]	
4														
5														
6	✓		✓		✓		✓		✓			✓	[signature]	
7	✓		✓		✓		✓		✓			✓	[signature]	
8	✓		✓		✓		✓		✓			✓	[signature]	
9	✓		✓		✓		✓		✓			✓	[signature]	
10	✓		✓		✓		✓		✓			✓	[signature]	
11	✓		✓		✓		✓		✓			✓	[signature]	
12	✓		✓		✓		✓		✓			✓	[signature]	
13	✓		✓		✓		✓		✓			✓	[signature]	
14	✓		✓		✓		✓		✓			✓	[signature]	
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17														
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21	✓		✓		✓		✓		✓			✓	[signature]	
22	✓		✓		✓		✓		✓			✓	[signature]	
23	✓		✓		✓		✓		✓			✓	[signature]	
24	✓		✓		✓		✓		✓			✓	C. Hurst	
25														
26														
27	✓		✓		✓		✓		✓			✓	[signature]	
28														
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31														

NOTES:

Daily inspection includes all components of the hazardous waste storage tank system including 55 gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500 gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500 gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500 gallon

HAZARDOUS WASTE TANK SYSTEM DAILY INSPECTION LOG

(AS REQUIRED BY 4 R 265 195)

BUSINESS NAME: APOLLO IND.
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: July
YEAR: 2012
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid? YES	NO	Is the system free of corrosion and evident damage? YES	NO	Are pipes, valves and pumps free of leaks and in good condition? YES	NO	Do open tanks have adequate free board? YES	NO	Is leak detection program/ equipment working? YES	NO	Any signs of wet spots, dead vegetation, etc. indicative of a release? YES	NO	Inspected by	Comments
1														
2	✓		✓		✓									
3	✓		✓		✓		✓		✓			✓	JM	
4		Holiday					✓		✓			✓	JM	
5	✓		✓		✓		Holiday					Holiday		
6	✓		✓				✓		✓			✓	JM	
7					✓		✓		✓			✓	JM	
8														
9	✓		✓		✓									
10	✓		✓		✓		✓		✓			✓	JM	
11	✓		✓		✓		✓		✓			✓	JM	
12	✓		✓		✓		✓		✓			✓	JM	
13	✓		✓		✓		✓		✓		✓		JM	Pulled weeds
14							✓		✓			✓		
15														
16	✓		✓											
17	✓		✓		✓		✓		✓			✓	JM	
18	✓				✓		✓		✓			✓	JM	
19	✓		✓		✓		✓		✓			✓	JM	
20	✓		✓		✓		✓		✓			✓	JM	
21												✓	JM	
22														
23	✓		✓											
24	✓		✓		✓		✓		✓			✓	JM	
25	✓		✓		✓		✓		✓		✓		JM	Pulled weeds
26	✓		✓		✓		✓		✓			✓	JM	
27	✓		✓		✓		✓		✓			✓	JM	
28									✓			✓	JM	
29														
30	✓		✓	✓	✓		✓		✓			✓	JM	
31	✓		✓		✓		✓		✓			✓	JM	

NOTES:
Daily inspection includes all components of the hazardous waste storage tank system including 55-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500 gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK SYSTEM DAILY INSPECTION LOG
(AS REQUIRED BY 4(265.195)

BUSINESS NAME: APOLLO INDL
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: June
YEAR: 2012
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. Indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓		✓		✓			✓	JM	
2														
3														
4	✓		✓		✓		✓		✓			✓	JM	
5	✓		✓		✓		✓		✓			✓	JM	
6	✓		✓		✓		✓		✓			✓	JM	
7	✓		✓		✓		✓		✓			✓	JM	cut weeds
8	✓		✓		✓		✓		✓			✓	JM	
9														
10														
11	✓		✓		✓		✓		✓			✓	JM	
12	✓		✓		✓		✓		✓			✓	JM	
13	✓		✓		✓		✓		✓			✓	JM	
14	✓		✓		✓		✓		✓			✓	JM	
15	✓		✓		✓		✓		✓			✓	JM	
16														
17														
18	✓		✓		✓		✓		✓			✓	JM	
19	✓		✓		✓		✓		✓			✓	JM	
20	✓		✓		✓		✓		✓			✓	JM	
21	✓		✓		✓		✓		✓			✓	[illegible]	
22	✓		✓		✓		✓		✓			✓	[illegible]	
23														
24														
25	✓		✓		✓		✓		✓			✓	JM	
26	✓		✓		✓		✓		✓			✓	JM	
27	✓		✓		✓		✓		✓			✓	JM	
28	✓		✓		✓		✓		✓			✓	JM	
29	✓		✓		✓		✓		✓			✓	JM	
30														
31														

OTES:
Daily inspection includes all components of the hazardous waste storage tank system including 55 gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500 gallon capacity storage tank,

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG
(AS REQUIRED CFR 265.195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: May-2012
YEAR:
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓									
2	✓		✓		✓		✓		✓			✓	[illegible]	Pull weeds out out side fence
3	✓		✓		✓		✓		✓		✓	✓	[illegible]	
4	✓		✓		✓		✓		✓			✓	[illegible]	
5							✓		✓			✓	[illegible]	
6														
7	✓		✓		✓				✓				[illegible]	
8	✓		✓		✓		✓				✓		[illegible]	Vegetation pulled
9	✓		✓		✓		✓		✓			✓	[illegible]	
10	✓		✓		✓		✓		✓			✓	[illegible]	
11	✓		✓		✓		✓		✓			✓	[illegible]	
12							✓		✓			✓	[illegible]	
13														
14					✓									
15	✓						✓		✓		✓		[illegible]	Vegetation pulled
16	✓		✓		✓		✓		✓			✓	[illegible]	
17			✓		✓		✓		✓			✓	[illegible]	
18			✓		✓				✓			✓	[illegible]	
19					✓		✓		✓			✓	[illegible]	
20														
21	✓		✓		✓		✓							
22	✓		✓		✓		✓		✓			✓	[illegible]	
23	✓		✓		✓		✓		✓			✓	[illegible]	
24	✓		✓		✓		✓		✓			✓	[illegible]	
25	✓		✓		✓		✓		✓			✓	[illegible]	
26							✓		✓			✓	[illegible]	
27							✓							
28	✓		✓		✓		✓		✓					
29	✓		✓		✓		✓		✓			✓	[illegible]	
30	✓		✓		✓		✓		✓			✓	[illegible]	
31	✓		✓		✓		✓		✓			✓	[illegible]	

NOTES:

1. Daily inspection includes all components of the hazardous waste storage tank system including ~~20~~ 55-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500 gallon

HAZARDOUS WASTE TANK S' :M DAILY INSPECTION LOG
(AS REQUIRED ' :FR 265 195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: APRIL
YEAR: 2012
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. Indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1														
2	✓		✓		✓		✓		✓			✓	[illegible]	
3	✓		✓		✓		✓		✓			✓	[illegible]	
4	✓		✓		✓		✓		✓			✓	[illegible]	
5	✓		✓		✓		✓		✓			✓	[illegible]	
6	✓		✓		✓		✓		✓			✓	[illegible]	
7														
8														
9	✓		✓		✓		✓		✓		✓		[illegible]	clean vegetation around dyke [illegible]
10			✓		✓		✓		✓			✓	[illegible]	
11	✓		✓		✓		✓		✓		✓	✓		
12	✓		✓		✓		✓		✓			✓	[illegible]	
13	✓		✓		✓		✓		✓			✓	[illegible]	
14														
15														
16	✓		✓		✓		✓		✓			✓	[illegible]	
17	✓		✓		✓		✓		✓			✓	[illegible]	
18	✓		✓		✓		✓		✓			✓	[illegible]	
19	✓		✓		✓		✓		✓			✓	[illegible]	
20	✓		✓		✓		✓		✓			✓	[illegible]	
21														
22														
23	✓		✓		✓		✓		✓			✓	[illegible]	
24	✓		✓		✓		✓		✓			✓	[illegible]	
25	✓		✓		✓		✓		✓			✓	[illegible]	
26	✓		✓		✓		✓		✓			✓	[illegible]	
27	✓		✓		✓		✓		✓			✓	[illegible]	
28														
29														
30	✓		✓		✓		✓		✓			✓	[illegible]	
31														

NOTES:
1. Daily inspection includes all components of the hazardous waste storage tank system including ~~20~~ 55-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500...

HAZARDOUS WASTE TANK S' :M DAILY INSPECTION LOG
(AS REQUIRED ı :FR 265.195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: March - 2012
YEAR:
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓		✓		✓			✓	JM	
2	✓		✓		✓		✓		✓			✓	JM	
3														
4														
5	✓		✓		✓		✓		✓			✓	JM	
6	✓		✓		✓		✓		✓			✓	JM	
7	✓		✓		✓		✓		✓			✓	JM	
8	✓		✓		✓		✓		✓			✓	JM	Cut [illegible]
9	✓		✓		✓		✓		✓			✓	JM	
10	✓		✓		✓		✓		✓			✓	JM	
11	✓		✓		✓		✓		✓			✓	JM	
12	✓		✓		✓		✓		✓			✓	JM	
13	✓		✓		✓		✓		✓			✓	JM	
14	✓		✓		✓		✓		✓			✓	JM	
15	✓		✓		✓		✓		✓			✓	JM	
16	✓		✓		✓		✓		✓			✓	JM	
17														
18														
19	✓		✓		✓		✓		✓			✓	JM	
20	✓		✓		✓		✓		✓			✓	JM	
21	✓		✓		✓		✓		✓			✓	JM	
22	✓		✓		✓		✓		✓			✓	JM	
23	✓		✓		✓		✓		✓			✓	JM	
24														
25														
26	✓		✓		✓		✓		✓			✓	JM	
27	✓		✓		✓		✓		✓			✓	JM	
28	✓		✓		✓		✓		✓			✓	JM	
29	✓		✓		✓		✓		✓			✓	JM	
30	✓		✓		✓		✓		✓			✓	JM	
31														

NOTES:
1 Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500 gallon

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG

(AS REQUIRED CFR 265 195)

BUSINESS NAME: APOLLO INDU

BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: FEB 2012

YEAR:

TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓		✓		✓			✓		
2	✓		✓		✓		✓		✓			✓		
3	✓		✓		✓		✓		✓			✓		
4														
5														
6	✓		✓		✓		✓		✓			✓		
7	✓		✓		✓		✓		✓			✓		
8	✓		✓		✓		✓		✓			✓		
9	✓		✓		✓		✓		✓			✓		
10	✓		✓		✓		✓		✓			✓		
11														
12														
13	✓		✓											
14	✓		✓		✓		✓		✓			✓		
15	✓		✓		✓		✓		✓			✓		
16	✓		✓		✓		✓		✓			✓		
17	✓		✓		✓		✓		✓			✓		
18														
19														
20	✓		✓		✓									
21	✓		✓		✓		✓		✓			✓		
22	✓		✓		✓		✓		✓			✓		
23	✓		✓		✓		✓		✓			✓		
24	✓		✓		✓		✓		✓			✓		
25														
26														
27	✓		✓		✓		✓		✓			✓		
28	✓		✓		✓		✓		✓			✓		
29	✓		✓		✓		✓		✓			✓		
30														
31														

NOTES:

1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK S' .M DAILY INSPECTION LOG
(AS REQUIRED , CFR 265.195)

BUSINESS NAME: APOLLO INDL
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: JAN
YEAR: 2012
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. Indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1														
2														
3	✓		✓		✓		✓							
4	✓		✓						✓			✓	[illegible]	
5	✓		✓		✓		✓		✓			✓	[illegible]	
6	✓		✓		✓		✓		✓			✓	[illegible]	
7					✓		✓		✓			✓	[illegible]	
8														
9	✓		✓		✓									
10	✓		✓		✓		✓		✓			✓	[illegible]	
11	✓		✓		✓		✓		✓			✓	[illegible]	
12	✓		✓		✓		✓		✓			✓	[illegible]	
13	✓		✓		✓		✓		✓			✓	[illegible]	
14							✓		✓			✓	[illegible]	
15														
16	✓		✓		✓		✓							
17	✓		✓						✓			✓	[illegible]	
18	✓		✓		✓		✓		✓			✓	[illegible]	
19	✓		✓		✓		✓		✓			✓	[illegible]	
20	✓		✓		✓		✓		✓			✓	[illegible]	
21			✓		✓		✓		✓			✓	[illegible]	
22														
23	✓		✓		✓									
24	✓		✓		✓		✓		✓			✓	[illegible]	
25	✓		✓		✓		✓		✓			✓	[illegible]	
26	✓		✓		✓		✓		✓			✓	[illegible]	
27	✓		✓		✓		✓		✓			✓	[illegible]	
28							✓		✓			✓	[illegible]	
29														
30	✓		✓		✓		✓							
31	✓		✓		✓		✓		✓			✓	[illegible]	

NOTES:
1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500 gallon

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG

(AS REQUIRED CFR 265.195)

BUSINESS NAME: APOLLO INDL
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED = JM

MONTH: Dec.
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid? YES	NO	Is the system free of corrosion and evident damage? YES	NO	Are pipes, valves and pumps free of leaks and in good condition? YES	NO	Do open tanks have adequate free board? YES	NO	Is leak detection program/ equipment working? YES	NO	Any signs of wet spots, dead vegetation, etc. indicative of a release? YES	NO	Inspected by	Comments
1	✓		✓		✓		✓		✓			✓		JM.
2	✓		✓		✓		✓		✓			✓		JM.
3														
4														
5	✓		✓		✓		✓		✓			✓		JM.
6	✓		✓		✓		✓		✓			✓		JM.
7	✓		✓		✓		✓		✓			✓		JM
8	✓		✓		✓		✓		✓			✓		JM.
9	✓		✓		✓		✓		✓			✓		JM
10														
11														
12	✓		✓		✓		✓		✓			✓		JM.
13	✓		✓		✓		✓		✓			✓		JM.
14	✓		✓		✓		✓		✓			✓		JM.
15	✓		✓		✓		✓		✓			✓		JM
16	✓		✓				✓		✓			✓		JM.
17														
18														
19	✓		✓		✓		✓		✓			✓		JM.
20	✓		✓		✓		✓		✓			✓		JM.
21	✓		✓		✓		✓		✓			✓		JM.
22	✓		✓		✓		✓		✓			✓		JM.
23	✓		✓		✓		✓		✓			✓		JM.
24														
25														
26														
27	✓		✓		✓		✓		✓			✓		[illegible]
28	✓		✓		✓		✓		✓			✓		[illegible]
29														
30														
31														

NOTES:

1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK S   ΞM DAILY INSPECTION LOG
(AS REQUIRED ı   ɔFR 265.195)

BUSINESS NAME: APOLLO INDL
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED = JM

MONTH: NOV - 2011
YEAR:
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓		✓		✓			✓	JM	
2	✓		✓		✓		✓		✓			✓	JM	
3	✓		✓		✓		✓		✓			✓	JM	
4	✓		✓		✓		✓		✓			✓	JM	
5														
6														
7	✓		✓		✓		✓		✓			✓	mm	
8	✓		✓		✓		✓		✓			✓	mm	
9	✓		✓		✓		✓		✓			✓	JM	
10	✓		✓		✓		✓		✓			✓	JM	
11	✓		✓		✓		✓		✓			✓	JM	
12														
13														
14	✓		✓		✓		✓		✓			✓	JM	
15	✓		✓		✓		✓		✓			✓	JM	
16	✓		✓		✓		✓		✓			✓	JM	
17	✓		✓		✓		✓		✓			✓	JM	
18	✓		✓		✓		✓		✓			✓	JM	
19														
20														
21	✓		✓		✓		✓		✓			✓	JM	
22	✓		✓		✓		✓		✓			✓	JM	
23	✓		✓		✓		✓		✓			✓	JM	
24														
25														
26														
27														
28	✓		✓		✓		✓		✓			✓	JM	
29	✓		✓		✓		✓		✓			✓	JM	
30	✓		✓		✓		✓		✓			✓	JM	
31														

NOTES:
1. Daily inspection includes all components of the hazardous waste storage tank system including 20 gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500 gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500 gallon

HAZARDOUS WASTE TANK S   EM DAILY INSPECTION LOG
(AS REQUIRED ,   CFR 265 195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED = J.M.

MONTH: Oct - 2011
YEAR:
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid? YES	NO	Is the system free of corrosion and evident damage? YES	NO	Are pipes, valves and pumps free of leaks and in good condition? YES	NO	Do open tanks have adequate free board? YES	NO	Is leak detection program/ equipment working? YES	NO	Any signs of wet spots, dead vegetation, etc. indicative of a release? YES	NO	Inspected by	Comments
1														
2														
3	✓		✓											
4	✓		✓		✓		✓		✓			✓		J.M.
5	✓		✓		✓		✓		✓			✓		J.M.
6	✓		✓		✓		✓		✓			✓		J.M.
7	✓		✓		✓		✓		✓			✓		J.M.
8					✓		✓		✓			✓		J.M.
9														
10	✓		✓											
11	✓		✓		✓		✓		✓			✓		J.M.
12	✓		✓		✓		✓		✓			✓		J.M.
13	✓		✓		✓		✓		✓			✓		J.M.
14	✓		✓		✓		✓		✓			✓		J.M.
15					✓		✓		✓			✓		J.M.
16														
17			✓											
18	✓		✓		✓		✓		✓			✓		J.M.
19	✓		✓		✓		✓		✓			✓		J.M.
20	✓		✓		✓		✓		✓			✓		J.M.
21	✓		✓		✓		✓		✓			✓		J.M.
22					✓		✓		✓			✓		J.M.
23														
24	✓		✓											
25	✓		✓		✓		✓		✓			✓		J.M.
26	✓		✓		✓		✓		✓			✓		J.M.
27	✓		✓		✓		✓		✓			✓		J.M.
28	✓		✓		✓		✓		✓			✓		J.M.
29							✓		✓			✓		J.M.
30														
31	✓		✓		✓		✓		✓			✓		J.M.

NOTES:

1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG
(AS REQUIRED CFR 265.195)

BUSINESS NAME: APOLLO INDL
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED = JM.

MONTH: Sept
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Wast Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid? YES	NO	Is the system free of corrosion and evident damage? YES	NO	Are pipes, valves and pumps free of leaks and in good condition? YES	NO	Do open tanks have adequate free board? YES	NO	Is leak detection program/ equipment working? YES	NO	Any signs of wet spots, dead vegetation, etc. indicative of a release? YES	NO	Inspected by	Comments
1	✓		✓		✓		✓		✓			✓		JM
2	✓		✓		✓		✓		✓			✓		JM
3														
4														
5														
6	✓		✓		✓									
7	✓		✓		✓		✓		✓			✓		JM
8	✓		✓		✓		✓		✓			✓		JM
9	✓		✓		✓		✓		✓			✓		JM
10	✓		✓		✓		✓		✓			✓		JM
11					✓		✓		✓			✓		JM
12	✓		✓		✓		✓		✓			✓		JM
13	✓		✓		✓		✓		✓			✓		JM
14	✓		✓		✓		✓		✓			✓		JM
15	✓		✓		✓		✓		✓			✓		JM
16	✓		✓		✓		✓		✓			✓		JM
17							✓		✓			✓		JM
18	✓		✓		✓									
19	✓		✓		✓		✓		✓			✓		JM
20	✓		✓		✓		✓		✓			✓		JM
21	✓		✓		✓		✓		✓			✓		JM
22	✓		✓		✓		✓		✓			✓		JM
23	✓		✓		✓		✓		✓			✓		JM
24							✓		✓			✓		JM
25														
26	✓		✓											
27	✓		✓		✓		✓		✓			✓		JM
28	✓		✓		✓		✓		✓			✓		JM
29	✓		✓		✓		✓		✓			✓		JM
30	✓		✓		✓		✓		✓			✓		JM
31					✓		✓		✓			✓		JM

NOTES:
1 Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500 gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG
(AS REQUIRED (CFR 265.195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

MONTH: August
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Wast Storage Tank & Associated Appurtenances

JAVEED SYED = JM

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓		✓		✓					
2	✓		✓		✓		✓		✓			✓		JM
3	✓		✓		✓		✓		✓			✓		JM
4	✓		✓		✓		✓		✓			✓		JM
5	✓		✓		✓		✓		✓			✓		JM
6												✓		JM
7														
8	✓		✓		✓									
9	✓		✓		✓		✓		✓			✓		JM
10	✓		✓						✓			✓		JM
11	✓		✓		✓		✓		✓			✓		JM
12	✓		✓		✓		✓		✓			✓		JM
13					✓		✓		✓			✓		JM
14														
15	✓													
16	✓		✓		✓		✓		✓			✓		JM
17	✓		✓		✓		✓		✓			✓		JM
18	✓		✓		✓		✓		✓			✓		JM
19	✓		✓		✓		✓		✓			✓		JM
20					✓		✓		✓			✓		JM
21														
22	✓													
23	✓		✓		✓		✓		✓			✓		JM
24	✓		✓		✓		✓		✓			✓		JM
25	✓		✓		✓		✓		✓			✓		JM
26	✓		✓		✓		✓		✓			✓		JM
27					✓		✓		✓			✓		JM
28														
29	✓													
30	✓		✓		✓		✓		✓			✓		JM
31	✓		✓		✓		✓		✓			✓		JM

NOTES:
1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500 gallon

HAZARDOUS WASTE TANK S   EM DAILY INSPECTION LOG
(AS REQUIRED   CFR 265.195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED = JM.

MONTH: July
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Wa Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid? YES	NO	Is the system free of corrosion and evident damage? YES	NO	Are pipes, valves and pumps free of leaks and in good condition? YES	NO	Do open tanks have adequate free board? YES	NO	Is leak detection program/ equipment working? YES	NO	Any signs of wet spots, dead vegetation, etc. indicative of a release? YES	NO	Inspected by	Comments
1	✓		✓		✓		✓		✓			✓		JM.
2														
3														
4														
5	✓		✓		✓		✓		✓			✓		JM.
6	✓		✓		✓		✓		✓			✓		JM.
7	✓		✓		✓		✓		✓			✓		JM.
8	✓		✓		✓		✓		✓			✓		JM.
9														
10														
11	✓		✓		✓		✓		✓			✓		JM.
12	✓		✓		✓		✓		✓			✓		JM.
13	✓		✓		✓		✓		✓			✓		JM.
14	✓		✓		✓		✓		✓			✓		JM.
15	✓		✓		✓		✓		✓			✓		JM.
16														
17														
18	✓		✓		✓		✓		✓			✓		JM.
19	✓		✓		✓		✓		✓			✓		JM.
20	✓		✓		✓		✓		✓			✓		JM.
21	✓		✓		✓		✓		✓			✓		JM.
22	✓		✓		✓		✓		✓			✓		JM.
23														
24														
25	✓		✓		✓		✓		✓			✓		JM.
26	✓		✓		✓		✓		✓			✓		JM.
27	✓		✓		✓		✓		✓			✓		JM.
28	✓		✓		✓		✓		✓			✓		JM.
29	✓		✓		✓		✓		✓			✓		JM.
30														
31														

NOTES:

1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500 gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG
(AS REQUIRED , CFR 265.195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED = JM.

MONTH: JUNE
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Wa Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓		✓		✓			✓		JM.
2	✓		✓		✓		✓		✓			✓		JM.
3	✓		✓		✓		✓		✓			✓		JM.
4														
5														
6	✓		✓		✓		✓		✓			✓		JM.
7	✓		✓		✓		✓		✓			✓		JM.
8	✓		✓		✓		✓		✓			✓		JM.
9	✓		✓		✓		✓		✓			✓		JM.
10	✓		✓		✓		✓		✓			✓		JM.
11														
12														
13	✓		✓		✓									
14	✓		✓		✓		✓		✓			✓		JM.
15	✓		✓		✓		✓		✓			✓		JM.
16	✓		✓		✓		✓		✓			✓		
17	✓		✓		✓		✓		✓			✓		
18														
19														JM.
20	✓		✓		✓		✓		✓			✓		JM.
21	✓		✓		✓		✓		✓			✓		JM.
22	✓		✓		✓		✓		✓			✓		JM.
23	✓		✓		✓		✓		✓			✓		JM.
24	✓		✓		✓									JM.
25														
26														
27	✓		✓		✓		✓		✓			✓		JM.
28	✓		✓		✓		✓		✓			✓		JM.
29	✓		✓		✓		✓		✓			✓		JM.
30	✓		✓		✓		✓		✓			✓		JM.
31														

NOTES:
1 Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500-gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG
(AS REQUIRED ʻ ƷFR 265.195)

BUSINESS NAME: APOLLO INDL
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED JM.

MONTH: MAY
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Was Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. Indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1														
2	✓		✓		✓		✓		✓			✓		J.M.
3	✓		✓		✓		✓		✓			✓		JM.
4	✓		✓		✓		✓		✓			✓		JM.
5	✓		✓		✓		✓		✓			✓		JM.
6	✓		✓		✓		✓		✓			✓		JM.
7														
8														
9	✓		✓		✓		✓		✓			✓		JM.
10	✓		✓		✓		✓		✓			✓		JM.
11	✓		✓		✓		✓		✓			✓		JM.
12	✓		✓		✓		✓		✓			✓		JM.
13	✓		✓		✓		✓		✓			✓		JM.
14														
15														
16	✓		✓		✓		✓		✓			✓		JM.
17	✓		✓		✓		✓		✓			✓		JM.
18	✓		✓		✓		✓		✓			✓		JM.
19	✓		✓		✓		✓		✓			✓		JM.
20	✓		✓		✓		✓		✓			✓		JM.
21														
22														
23	✓		✓		✓		✓		✓			✓		JM.
24	✓		✓		✓		✓		✓			✓		JM.
25	✓		✓		✓		✓		✓			✓		JM.
26	✓		✓		✓		✓		✓			✓		JM.
27	✓		✓		✓		✓		✓			✓		JM.
28														
29														
30														
31	✓		✓		✓		✓		✓			✓		JM.

NOTES:
1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500 gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

HAZARDOUS WASTE TANK S EM DAILY INSPECTION LOG
(AS REQUIRED CFR 265.195)

BUSINESS NAME: APOLLO INDU
BUSINESS ADDRESS: 1850 SOUTH COBB INDUSTRIAL BLVD., SMYRNA, GEO

JAVEED SYED = JVA

MONTH: APRIL
YEAR: 2011
TANK SYSTEM ID: 7,500-Gallon Hazardous Waste Storage Tank & Associated Appurtenances

DAY	Is secondary containment free of waste and liquid?		Is the system free of corrosion and evident damage?		Are pipes, valves and pumps free of leaks and in good condition?		Do open tanks have adequate free board?		Is leak detection program/ equipment working?		Any signs of wet spots, dead vegetation, etc. indicative of a release?		Inspected by	Comments
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
1	✓		✓		✓		✓		✓					
2												✓	J. Syed	
3														
4	✓		✓		✓		✓		✓					
5	✓		✓		✓		✓		✓			✓	J. SYED	
6	✓		✓		✓		✓		✓			✓	J. Syed	
7	✓		✓		✓		✓		✓			✓	J. Syed	
8	✓		✓		✓		✓		✓			✓	J. Syed	
9												✓	J. Syed	
10														
11	✓		✓		✓									
12	✓		✓		✓		✓		✓			✓	J. Syed	
13	✓		✓		✓		✓		✓			✓	J. Syed	
14	✓		✓		✓		✓		✓			✓	J. SyV.	
15	✓		✓		✓		✓		✓			✓	J. SyV.	
16							✓		✓			✓	J. SyV.	
17														
18	✓		✓		✓									
19	✓		✓		✓		✓		✓			✓	JV	
20	✓		✓		✓		✓		✓			✓	JV.	
21	✓		✓		✓		✓		✓			✓	JV.	
22	✓		✓		✓		✓		✓			✓	JV.	
23												✓	JV.	
24														
25	✓		✓		✓		✓		✓					
26	✓		✓		✓		✓		✓			✓	JV.	
27	✓		✓		✓		✓		✓			✓	JV.	
28	✓		✓		✓		✓		✓			✓	JV.	
29	✓		✓		✓		✓		✓			✓	JV.	
30												✓	JV.	
31														

NOTES:
1. Daily inspection includes all components of the hazardous waste storage tank system including 20-gallon satellite accumulation container, piping from satellite accumulation tank to the 7,500-gallon capacity storage tank, pumps, valves and hoses used to transfer the contents of the satellite accumulation container to the 7,500 gallon storage tank, secondary containment devices for both the satellite accumulation container and 7,500-gallon

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: MARCH— 2011

Date	Inspector	Date	Inspector
1	M.	16	M.
2	M.	17	M.
3	M.	18	M.
4	M.	19	
5		20	
6		21	M.
7	M.	22	M.
8	M.	23	M.
9	M.	24	M.
10	M.	25	M.
11	M.	26	
12		27	
13		28	M.
14	M.	29	M.
15	M.	30	M.
		31	M

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

____

____

Review: ______________________________
Plant Manager

Date: ______________________________

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: FEB 2011

Date	Inspector	Date	Inspector
1	JM	16	JM
2	JM	17	JM
3	JM	18	JM
4	JM	19	
5		20	
6		21	JM
7	JM	22	JM
8	JM	23	JM
9	JM	24	JM
10	JM	25	JM
11	JM	26	
12		27	
13		28	JM
14	JM	29	
15	JM	30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

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Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: Jan- 2011

Date	Inspector	Date	Inspector
1		16	
2		17	JM
3	JM	18	JM
4	JM	19	JM
5	JM	20	JM
6	JM	21	JM
7	JM	22	
8		23	[illegible]
9		24	JM
10	JM	25	JM
11	JM	26	JM
12	JM	27	JM
13	JM	28	JM
14	JM	29	
15	M	30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ____________________

Review: ____________________ Date: ____________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: DEC 2010

Date	Inspector	Date	Inspector
1	JM	16	JM
2	JM	17	JM
3	JM	18	
4		19	
5		20	JM
6	JM	21	JM
7	JM	22	JM
8	JM	23	JM
9	JM	24	
10	JM	25	
11	JM	26	
12		27	
13	JM	28	
14	JM	29	
15	JM	30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

Review: ____________________ Date: ____________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: NOV. 2010

Date	Inspector	Date	Inspector
1	[illegible]	16	[illegible]
2	[illegible]	17	[illegible]
3	[illegible]	18	[illegible]
4	[illegible]	19	[illegible]
5	[illegible]	20	
6	[illegible]	21	
7		22	[illegible]
8	[illegible]	23	[illegible]
9	[illegible]	24	[illegible]
10	[illegible]	25	
11	[illegible]	26	
12	[illegible]	27	
13	[illegible]	28	
14	[illegible]	29	[illegible]
15	[illegible]	30	[illegible]
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: Oct. 2010

Date	Inspector	Date	Inspector
1	[signature]	16	
2	[signature]	17	[signature]
3		18	[signature]
4	[signature]	19	[signature]
5	[signature]	20	[signature]
6	[signature]	21	[signature]
7	[signature]	22	[signature]
8	[signature]	23	[signature]
9	[signature]	24	[signature]
10	[signature]	25	[signature]
11	[signature]	26	[signature]
12	[signature]	27	[signature]
13	[signature]	28	[signature]
14	[signature]	29	[signature]
15	[signature]	30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________

Review: ______________________
Plant Manager

Date: ______________________

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: Sept. 2010

Date	Inspector	Date	Inspector
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

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Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: Aug - 2010

Date	Inspector	Date	Inspector
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

Review: ____________________ Date: ________________

Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: July - 2010

Date	Inspector	Date	Inspector
1	[illegible]	16	[illegible]
2	[illegible]	17	[illegible]
3		18	[illegible]
4	[illegible]	19	[illegible]
5	[illegible]	20	[illegible]
6	[illegible]	21	[illegible]
7	[illegible]	22	[illegible]
8	[illegible]	23	[illegible]
9	[illegible]	24	
10	[illegible]	25	
11	[illegible]	26	[illegible]
12	[illegible]	27	[illegible]
13	[illegible]	28	[illegible]
14	[illegible]	29	[illegible]
15	[illegible]	30	[illegible]
	[illegible]	31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

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Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: June 2010

Date	Inspector	Date	Inspector
1	JM	16	JM
2	JM	17	JM
3	JM	18	JM
4	JM	19	
5	JM	20	
6		21	JM
7	M	22	JM
8	JM	23	JM
9	JM	24	JM
10	JM	25	JM
11	JM	26	
12	JM	27	
13	JM	28	JM
14	JM	29	JM
15	JM	30	JM
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed. unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

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Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: May 2010

Date	Inspector	Date	Inspector
1	JM	16	
2		17	JM
3		18	JM
4	JM	19	JM
5	JM	20	JM
6	JM	21	JM
7	JM	22	
8	JM	23	
9	JM	24	JM
10	JM	25	JM
11	JM	26	JM
12	JM	27	JM
13	JM	28	JM
14	JM	29	JM
15	JM	30	
		31	JM

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

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Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: APRIL / 2010

Date	Inspector	Date	Inspector
1	[illegible]	16	[illegible]
2	[illegible]	17	[illegible]
3	[illegible]	18	
4		19	[illegible]
5	[illegible]	20	[illegible]
6	[illegible]	21	[illegible]
7	[illegible]	22	[illegible]
8	[illegible]	23	[illegible]
9	[illegible]	24	[illegible]
10		25	
11	[illegible]	26	[illegible]
12	[illegible]	27	[illegible]
13	[illegible]	28	[illegible]
14	[illegible]	29	[illegible]
15	[illegible]	30	[illegible]
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

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Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: March - 2010

Date	Inspector	Date	Inspector
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/
Summary ______________________________

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Review: ______________________ Date: ______________________
Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: FEB — 2010

Date	Inspector	Date	Inspector
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	
14		29	
15		30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/ Summary: All O.K.

Review: ______________________ Date: ______________________

Plant Manager

LIQUID HAZWASTE INSPECTION LOG

Month/Yr: JAN — 2010

Date	Inspector	Date	Inspector
1	JM	16	
2	JM	17	
3		18	JM
4	JM	19	JM
5	JM	20	JM
6	JM	21	JM
7	JM	22	JM
8	JM	23	
9		24	
10		25	JM
11	JM	26	JM
12	JM	27	JM
13	JM	28	JM
14	JM	29	JM
15	JM	30	
		31	

The above signed certifies that an inspector has inspected the Liquid Hazwaste and storage areas on the date indicated. No leaks or spills were observed, unless noted, in the HAZWASTE INSPECTION LOG.

Comments/ Summary: All O.K.

Review: ______________________ Date: ______________________
Plant Manager

COATING PRODUC[illegible] DESCRIPT[illegible]

ATTACHMENT 5

SECONDARY CONTAINMENT COATING

PPG Protective & Marine Coatings

PPG Anti-Slip Safety Flooring Systems SFT 650

Low VOC, Fast Dry, Heavy Duty Epoxy Anti-slip

Product Data/ Application Instruction

PPG Anti-Slip Safety Flooring Systems SFT 650 is a two-component, general purpose, vehicular grade, epoxy anti-slip floor and deck coating engineered for slippery areas and used to resist heavy rolling and pedestrian traffic.

SFT 650 is suitable for marine and industrial environments while being easy to apply. It adheres to concrete, metal, and wood surfaces.

SFT 650 is fire retardant when dry. It has excellent chemical resistance to oil, gasoline, acids, caustics, hydraulic fluids and most solvents.

Typical Uses

- Heavy industrial areas
  - Heavy rolling traffic
  - Heavy impact requirement
- Transit systems
- Entrances
- Stadiums
- Loading areas or docks
- Garages and warehouses

Products

99-65002	Black
99-65003	Tile Red
99-65015	Gray
99-65060	Safety Yellow
99-65033	Cure

Physical Data

Colors	Black, Tile Red, Gray, Safety Yellow	
Finish	Flat	
Anti-slip Profile	Medium to High	
Package size	1 and 5 gallons	
Components	2	
Curing mechanism	Chemical reaction between components	
Volume solids	70% (calculated)	
Coats	1	
DFT per coat	mils 20 to 25	microns 500 to 625
Theoretical coverage	ft²/gal	m²/L
30 mils (375 microns) rolled	40	1.0
25 mils (250 microns) troweled	50	1.2
25 mils (250 microns) sprayed	60	1.5
VOC (EPA 24)	lb/gal 2.07	g/L 247
Flash point (SETA)	°F 81	°C 27
Coefficient of Friction	Dry 1.05	Wet 1.05

Surface Preparation

Coating performance is proportional to the degree of surface preparation. Refer to the Product Data/Application Instructions for the specific primer being used for surface preparation specifications. Concrete and primed concrete surfaces must be clean and dry and free of contaminants such as dust, dirt, grease, or oil. It is important that a suitable moisture barrier is in place for slabs on-grade. If a moisture barrier is not in place, seasonal variations in ground moisture can cause excessive hydrostatic pressure regardless of results measured prior to coating application.

New/Bare Concrete — Refer to SSPC-SP 13/NACE No. 6 surface preparation of concrete for detailed information regarding surface preparation of concrete. In general, concrete must have sufficient profile to achieve satisfactory adhesion of primer and topcoat. Concrete must be in sound condition and free of all coatings, curing compounds, oil and other contaminants. New concrete must cure a minimum of 28 days prior to application of any coatings. Concrete can be abrasive blasted (ASTM D4259) or mechanically abraded to achieve a profile equal to 60 grit sandpaper or coarser. Moisture vapor transmission should be 3 lbs. or less over a 1000 sq. ft. area during a 24 hour period, measured and confirmed through a calcium chloride test (ASTM F1869). Concrete should have a minimum surface tensile strength of 300 PSI verified by a pull-off adhesion test. Should concrete not meet moisture vapor transmission or tensile strength requirements, contact your local PPG representative for guidance. Consult the following ASTM methods: ASTM-4263 – plastic sheet method for checking moisture in concrete; ASTM 4258 standard practice for cleaning concrete; ASTM 4259 standard practice for abrading concrete; ASTM 4260 standard practice for etching concrete.

Previously Painted Concrete — Old coatings and concrete must be in sound condition. Surfaces must be clean and dry and free of all contaminants such as dust, dirt, grease, or oil. Old coatings must be uniformly abraded to achieve satisfactory adhesion. Apply a test patch to the abraded surface and allow to cure a minimum of one week before testing adhesion. If adhesion is poor, or if the old coatings are peeling, chipping, or are otherwise in poor condition, remove the coatings down to bare concrete and prepare the bare concrete as shown above.

Wood and metal surfaces — contact your PMC specialist for a recommendation.

Application Data

Applied over	Concrete, metal and wood surfaces	
Primers*	Self Priming over concrete and wood	
Concrete	Amerlock 2, Amerlock Sealer - add Amerlock 2VOC, Pitt-Guard	
Metal Surfaces	Amerlock 2 or Amerlock 2VOC, Pitt-Guard	

** When using an epoxy primer, the SFT 650 should be applied within 72 hours of application of the epoxy.*

Surface Preparation	ASTM D4260 or 4259; SSPC-SP10	
Method	Roller, trowel, or spray	
Mixing ratio (by volume)	18 to 1 (mix full kit)	
Environmental conditions		
Temperature	°F	°C
surface	50 to 130	20 to 54

Surface temperatures must be at least 5°F (3°C) above dew point to prevent condensation. Relative humidity must not exceed 85%.

Pot Life	4 hours at 70°F	
Drying time (hours, @25 mils DFT, 50% RH)		
	°F/°C	
	70/21	35/2
Foot traffic	12	36-48
Heavy traffic	48	96
Clean-up Solvent	Amercoat 12 Cleaner	

Instructions for Use

Mixing should be done with a mechanical mixer such as a pneumatic drill motor with a Jiffy mixing blade. Pre-mix the base component for several minutes making sure all material is lifted off the bottom and uniformly mixed. Pour entire contents of hardener can into base material. Mix thoroughly as above for 3-5 minutes until contents are a uniform color.

ROLLER

The best anti-slip characteristics are obtained when the product is rolled. Do not thin. Use a smooth napless solvent resistant roller.

1. Pour a "strip" of SFT 650 on the surface approximately 2' long and 6" wide.
2. Roll in one direction only by pulling material toward you in slow straight strokes.

Use a modest amount of downward pressure. It is important that the rolled profile expose the maximum amount of non-slip aggregate. If aggregate is not properly exposed, the coating may become slippery when wet.

Do not over-roll or press down too heavily. Make sure that coating is even without any thick puddles. If applied too heavily the coating may not cure properly.

Drying time will vary with temperature and humidity. Protect exterior applications from rain for at least 24 hours. For full cure, protect application from extended exposure to water, oil and chemicals for 5 to 7 days.

SPRAY

Sprayed applications will result in a uniform appearance with good non-slip characteristics. SFT 650 may be sprayed with spray equipment using a 1/4 inch opening spray tip. To adjust spraying material may be thinned with 1 to 3 pints of Amercoat 65 or Xylol per 5 gallons of material. This will increase the V.O.C. 20 grams per liter for each pint of solvent. Caution must be exercised not to excessively thin material or exceed local VOC regulations when thinning. Also excessive thinning could result in grit not remaining properly in suspension. Various sprayers are available for grit containing coatings such as mastic type spray equipment. Consult with your equipment manufacturer. An example set-up is as follows:

A 5-gallon bottom outlet pressure tank equipped with a double regulator and an air driven agitator, and 1" I.D. outlet pipe. 25 feet of 3/8" air hose with 3/8" female connectors at each end. 25 feet of 3/4" material hose with 3/4" female connectors at each end. A Binks Model 7E2 spray gun equipped with 1/4" (#45) fluid nozzle and a 1/4" internal air cap or a Binks Model 52-2012 (4 foot) pole gun equipped with the same fluid nozzle and air nozzle. Minimum air supply required is 20 CFM at 90 lbs. pressure. Recommended pressure is 15-20 psi on material and 20-25 psi on atomization. Always keep atomization air pressure higher than pot pressure. Keep agitator running slowly. Good coverage and film thickness will be obtained working at 18" or 24" distance from surface. Overlap strokes about 50%. Make sure of wet application. Very little abrasive rebound will be noticed at 15 psi; however, it will be more noticeable at higher pressures.

TROWEL

SFT 650 may be applied with a smooth trowel such as a flexible plasterer's finishing trowel. Use a trowel about 4 by 12 inches.

Pour a "strip" of SFT 650 on the surface approximately 2' long and 6" wide.

Hold the trowel at a 45° angle to the surface and spread with a full motion. Reverse the angle of the trowel for an opposite stroke. Pull the material toward you. To cover corners, etc. pull straight strokes using material on the trowel.

Surface Maintenance

SFT 650 should be kept clean to ensure that its non-slip safety aspect is maintained. Clean with an all-purpose cleaner/ degreaser. Scrub the anti-slip surface with a thick bristled brush or floor machine. Rinse with clean water and let dry. SFT 650 is extremely durable; however, frequently traveled areas may require occasional touch up.

Shipping Data

Packaging units	1 gallon	5 gallon
Shipping weight (approx)	16 lbs	80 lbs

Shelf life when stored indoors at 40 to 100°F (4 to 38°C) 1 year from shipment date

Numerical values are subject to normal manufacturing tolerances, color and testing variances. Allow for application losses and surface irregularities. See application instructions for complete information and safety precautions.

Safety Precautions

Read each component's material safety data sheet before use. Mixed material has hazards of both components. Safety precautions must be strictly followed during storage, handling, and use. **This product is for professional use only. Not for residential use.**

Warranty

PPG warrants only its title to the products, and that the products will be set forth in the warranty statement, if any, on the products labeling or in the absence of any such warranty statement that the products will conform to PPG's applicable published specifications. PPG's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at PPG's option, to either replacement of products not conforming to this Warranty or credit to Buyer's account in the invoiced amount of the nonconforming products. Any claim under this Warranty must be made by Buyer to PPG in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life, or one year from the delivery date, whichever is earlier. Buyer's failure to notify PPG of such nonconformance as required herein shall bar Buyer from recovery under this Warranty.

PPG makes no other warranties concerning the product. No other warranties, whether express, implied, or statutory, such as warranties of merchantability or fitness for a particular purpose, shall apply.

Any recommendation or suggestion relating to the use of the products made by PPG, whether in its technical literature, or in response to specific inquiry, or otherwise, is based on data believed to be reliable; however, the products and information are intended for use by Buyers having requisite skill and know-how in the industry, and therefore it is for Buyer to satisfy itself f the suitability of the products for its own particular use and it shall be deemed that Buyer has done so, at its sole discretion and risk. Variation in environment, changes in procedures of use, or extrapolation of data may cause unsatisfactory results.

Due to PPG's policy of continuous product improvement, the information contained in this Product Data/Application Instructions sheet is subject to change without notice. It is the Buyer's responsibility to check that this issue is current prior to using the product. For the most up-to-date Product Data/Application Instructions always refer to the PPG Protective & Marine Coatings website at www.ppgpmc.com

Limitation of Liability

PPG's liability on any claim of any kind, including claims based upon PPG's negligence or strict liability, for any loss or damage arising out of, connected with, or resulting from the use of the products, shall in no case exceed the purchase price allocable to the products, or part thereof which give rise to the claim. In no event shall PPG be liable for consequential or incidental damages.

EMPLOYEE
LIST

NO DESCRIPTION
OF POSITION
~~OF AMOUNT~~
WITH RESPECT T
HW TRAINING
NEEDED +
HW MGT
RESPONSIBILI

ATTACHMENT 6

Apollo Smyrna Production Plant Employee List			
Eename	**Deptcode**	**Position**	
CONDE, CARLOS	200	Production Supervisor	
RIVERA, ONORIA E.	200		
ROWLAND, THOMAS	200		
ARREOLA DEMENDOZA, AMALIA	210	General Plant Worker	
ARREOLA-DECHICO, MARIA	210		
DIAZ DEJESUS, CARLA	210		
DORTA-PELLOT, NOEMI	210		
DURAN-PALACIO, MA G	210		
ESTRADA RAMOS, JEREMIAS	210		
FFIELD, MAURICIO	210		
GARCIA, MARTIN	210		
GONZALEZ, SANDRA	210		
HERNANDEZ-VAZQUEZ, NICOLASA	210		
LOPEZ-SORROZA, LUCIA	210		
MONTELONGO, SILVIA T	210		
OVANDO, VERONICA	210		
PEREZ RAMIREZ, FERNANDO	210		
PULIDO, SUSANA	210		
RAMIREZ, BERTHA A	210		
RODRIGUEZ, MARIA E	210		
RODRIGUEZ, RICARDO	210		
SALGADO, RENE	210		
SALGADO, VIANETH	210		
SALGADO, ROGELIO U	210		
SALGADO DE SALGADO, SILVIA	210		
SALGADO SALGADO, EVILU	210		
SOLANO-MARTINEZ, URANIA E	210		
TORRES, LILIANA	210		
UMANA, ADELINA	210		
UNGER, MIRIAM	210		
VASQUEZ, ANDRES	210		
VILLA, GREGORIA	210		
GIBSON JR, JASON THOMAS	220	Gas Room Operator	

VASQUEZ LOPEZ, VALFRE ESTEBAN	220		
FELICIANO, RAFAEL	230	Filler Operator	
RUBIO, PEDRO	230		
RUBIO, DENIS	230		
CUEVA DE CONDE, MARIA L	240	Production Labeling	
HERNANDEZ, RANGEL	240		
RIVERA-CUEVA, JONATHAN S	240		
ZARATE-DORTA, GIOVANNIE E	240		
CONDE BARAHONA, MANUEL D.	250	Stocker	
HALL , HELEN R	300	Chemical Compounder/Manager	
MALDANADO, ADAN DE JESUS	300		
MONROE, KARL L	300		
PERDUE, BRIAN RAY	300		
RUSSELL, GREGORY L	300		
SMITH, ERIC R.	300		
GALLARDO, LILIA	400	Quality Control Technician/Manager	
MATTHEWS, SHERISE BRITTAN	400		
SIMS, JUDY E.	400		
YANZA FLORES, MARJORIE	400		
BATTLE, MICHEAL	500	Maintenance	
CLEVELAND, RICKEY L.	500		
COTTINGHAM, RANDALL	500		
PERDOMO CUEVAS, JOSE SALOMON	500		
SMITH, BARRY G.	500		
GONZALES, ROSA	510	Laboratory Technician/Manager	
MENDOZA JIMENEZ, JOSEFINA	510		
PINEDO CHAVEZ, JUAN ANTONIO	510		
MAZARIEGOS-ROBLERO, CECILIA M.	600	Labeling	
RUBIO, ISABEL	700	Shipping and Receiving	
WILEY, PAUL M.	700		
WILLIAMS, ANTONIO D	700		
GRAY, MICHAEL W.	800	QC Manager	
MAY, KEVIN J.	800		
MOORE, STEVEN V.	800		
RIVERA, LYDIA I	800		

SILVA-VILLAMIZAR, OSCAR	800		
QUERISHI, HABEEBA AKHTER	000400S		
GRIMSLEY, DAVID LEE	000700S		
MARTIN, HERBERT L.	000700S		
TORRE, CESAR A	000700S		
WOOD, ROBERT K.	000700S		

SOP

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ATTACHMENT 7

STANDARD OPERATING PROCEDURE

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

PRP-000-02

Production Index

Written/Revised By ________ Date 2/9/12
Approved By ________ Date 2/10/12
Reviewed By ________ Date 2.11.12.
Reason for Revision Review

STANDARD OPERATING PROCEDURE

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Written/Revised By [signature] Date 2/9/12
Approved By [signature] Date 2/10/12
Reviewed By [signature] Date 2.11.12
Reason for Revision Review

STANDARD OPERATING PROCEDURE

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

SPP-000-01

Safety Program Procedure Index

Written/Revised By [signature] Date 5/13/10
Approved By [signature] Date 3.19.12.
Reviewed By [signature] Date 3/15/12
Reason for Revision Review

STANDARD OPERATING PROCEDURE

Apollo Technologies
Smyrna, GA

PRP-000-03

Production Index

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Written/Revised By ______________ Date ______________
Approved By ______________ Date ______________
Reviewed By ______________ Date ______________
Reason for Revision ______________

NEEDS TRAINING
DESCRIPTION

ATTACHMENT 8

DATE: 12/03/2010

TRAINER: Javeed Syed

HAZARD COMMUNICATION & RIGHT TO KNOW/HAZARDOUS WASTE TRAINING

NAME	JOB TITLE	TYPE OF TRAINING	SIGNATURE
Peter Dunn	Compounding Mgr	Right to know&Hazardous Waste	Peter Dunn
Jose Garcia	Compounder	Right to know&Hazardous Waste	Jose Garcia
Noe Herra Lazano	Compounder	Right to know&Hazardous Waste	Noe Herrera
jose' Sorroza	Gas room operator	Right to know&Hazardous Waste	Jose Sorroza
Ceasar Galarza	Gas room operator	Right to know&Hazardous Waste	Cesar Galarza
Rick Cleveland	Maint. Mechanic	Right to know&Hazardous Waste	[illegible]
Barry Smith	Maint. Mechanic	Right to know&Hazardous Waste	Barry Smith
Randy Cottingham	Maint. Mechanic	Right to know&Hazardous Waste	Randall Cottingham
Michael Batte	Maint. Mechanic	Right to know&Hazardous Waste	Michael Batte
Steve Moore	Technical Director	Right to know&Hazardous Waste	[illegible]
Habbeba Querishi	Q.C. Mgr	Right to know&Hazardous Waste	Habeeba Quereshi
~~Miriam Unger~~	~~Q.C. Technician~~	~~Right to know&Hazardous Waste~~	
JudySeams	Q.C. Technician	Right to know&Hazardous Waste	Judy Seams
Michael Gray	Chemist	Right to know&Hazardous Waste	[illegible]
Oscar Silva	Chemist	Right to know&Hazardous Waste	Oscar Silva
Kevin May	Chemist	Right to know&Hazardous Waste	[illegible]
Helen HALL	Compounder	Right to Know Hazardous waste	Helen Hall 8-18-
Adan Ma[illegible]	Compounding	Right to know Haz. waste	[illegible] 9/19/11

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-08-04

	ATTENDEES	JOB TITLE	SIGN-IN
1	Arleti	Produccion	[illegible]
2	Jose Perdomo	Produccion	[illegible]
3	Ana Castillo	Produccion	A. N. C.
4	Dagoberto Ramirez	Production	[illegible]
5	Ruben lopez	Filler operator	Ruben lopez
6	Felimon Vasquez S	STACKER	[illegible]
7	Yovan Huerta del Angel	Produccion	Yovan Huerta
8	Mariela Calderon	QC	Mariela Calderon
9	Lilia Gallardo	QC	Lilia Gallardo
10	Rocio Dominguez	Produccion	Roce Dominguez
11	Rosa Guzman	Producion	Rosa Guzman
12	Rosa Angelica V.	Produccion	Rosa Angelica V.
13	Ray [illegible]	PRODUCTION	[illegible]
14	Marnia N. conde	Produccion	[illegible]
15	Daniel A. Fiallos	Batch room	[illegible]
16	Baltazar gonzalez perez	PRODUCTION	[illegible]

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-08-09

	ATTENDEES	JOB TITLE	SIGN-IN
1	LIZA PEREZ	produccion	[illegible]
2	Carlos Beiza	Produccion	Carlos Beiza
3	Claudia Milian	Produccion	Claudia Milian
4	JAVIER DELGADO	Produccion	[illegible]
5	NEftali Silva	producion	NEFtali Silva
6	Manuel Delgado R.	Produccion	Manuel Delgado
7	Fernando Fiscal	Producion	[illegible]
8	JULIO C. ACOSTA	PRODUCION	[illegible]
9	Rodolfo Figueroa Sanchez	produccion	[illegible]
10	Noe Herrera L	[illegible]	Batch Room Compounding
11	Miriam Unger	Q.C.	[illegible]
12	Madeline Smith	QC	Madeline Smith
13	Judy Sims	QC	Judy Sims
14	Kevin May	R&D	[illegible]
15	Robby Wood	Rec.	Robby Wood
16	Rick Cleveland	Maint	Rick Cleveland

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-08-09

	ATTENDEES	JOB TITLE	SIGN-IN
1	Andres Vazquez	PRODUCTION	[illegible]
2	Nicolasa	PRODUCTION	Nicolasa
3	Cesar Campo R.	PRODUCTION	[illegible]
4	Veronica Obando	PRODUCTION	[illegible]
5	Angelica Alonso	PRODUCTION	[illegible]
6	Maria Rubio	PRODUCTION	Maria Rubio
7	Leonardo Menchaca	PRODUCTION	[illegible]
8	AUREA RAMIREZ	PRODUCTION	Aurea Ramirez
9	Piedad Ruiz	PRODUCTION	Piedad Ruiz
10	DENI RUBIO	filler operator	DENI RUBIO
11	Blanca Dominguez	Production	Blanca Dominguez
12	Janifer Cabrera	Production	Janifer Cabrera
13	Aracely Reyes	Production	[illegible]
14	Ximena Sierra	PRODUCTION	[illegible]
15	Janet Angeles	PRODUCTION	[illegible]
16	Gregoria Villa	Production	

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-08-09

	ATTENDEES	JOB TITLE	SIGN-IN
1	Maria Ines Bonilla	Production	Maria Ines Bonilla
2	Misael Rivera	Production	[illegible]
3	Beulloke Lorenzo	Production	[illegible]
4	Enriqueta Rivera	Production	Enriqueta Rivera
5	Marisol	Production	[illegible]
6	Magdali Maldonado	Production	[illegible]
7	Maria Yoselin Sandoval Pide	Production	Ma Yoselin Sandoval Pide
8	christina Medina	Production	Christina Medina
9	Angelica Loeza	Production	[illegible]
10	FRANCISCO-VAZQUEZ	Production	[illegible]
11	Sandra Gonzalez	Production	[illegible]
12	Graciela f Avila	Production	Graciela f Avila
13	JUAN RODRIGUEZ	Production	JUAN RODRIGUEZ
14	Oscar Silva	Chemist	OSilva
15	Manuel Cano	Production	[illegible]
16	Lucia Lopez	PRODUCTION	[illegible]

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-08-'09

	ATTENDEES	JOB TITLE	SIGN-IN
1	Kerry Fisher	maintance	Kerry Fisher
2	Peter Dunn	Plant Mgr	Peter Dunn
3	Sammy Scott	Analytical Chemist	Sammy Scott
4	Jody Hamby	Maintenance	[illegible]
5	ERIC Smith	PROJECT MANAGER	[illegible]
6	Barry Smith	Maintance	Barry Smith
7	Steve Mo[illegible]	Technical Director	[illegible]
8	Calos Conde	Production manager	[illegible]
9	[illegible]	Line supervisor	[illegible]
10	Jose Garcia	Compounding	Jose Garcia
11	PAUL WILEY	Shipping	[illegible]
12	Lee Martin	Shipping	Lee Martin
13	[illegible] Rubio	Shipping	[illegible]
14	Samuel [illegible]	Labeling	[illegible]
15	B. McClean	QC manager	B. McClean
16			

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-08-09

	ATTENDEES	JOB TITLE	SIGN-IN
1	Cesar Galarza	Gas House Ope.	[signature]
2	José Vasquez	Gas House Ope.	[signature]
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HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 3-12-09

	ATTENDEES	JOB TITLE	SIGN-IN
1	Ronald Long	Lab Tech	[illegible]
2	VALENTE CASTANEDO	Q C	Valente Castaneda
3	ANDRE' VAUGHN	MAINT MECH	Andre Vaughn 3/27/09
4	SAMMY SCOTT	Analytical Chemist	Sammy Scott 06/08/09
5	JUAN CARLOS RUBIO R	Compounding Batch man	JUAN CARLOS RUBIO R ~~05~~ 06-~~27~~ 08-09
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HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 2/27/09

	ATTENDEES	JOB TITLE	SIGN-IN
1	Abisai Velasquez	Produccion	Abisai Velasquez
2	Claudia Milan	Production	Claudia Milan
3	Christina Medina	Production	Christina Medina
4	Neftali Velasquez Silva	Forklift	Neftali Velasquez Silva
5	Ma de Jesus Figueroa	Production	[illegible]
6	Julio Cesar Acosta	Produccion	[illegible]
7	Henry M. Pareiro	Production	[illegible]
8	Sandra Gonzalez	Produccion	[illegible]
9	Magdali Maldonado	Produccion	[illegible]
10	Arleti Maldonado	Produccion	[illegible]
11	Laura Rodriguez	Produccion	Laura Rodriguez
12	Heidi A Claros Diaz	Produccion	[illegible]
13	Jose Ibarra	Produccion	[illegible]
14	VALENTE R CASTANEDA	Produccion	Valente R Castaneda
15	Luz Sierra	Produccion	[illegible]
16	Rosa Guzman	Produccion	Rosa Guzman

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-18-08

	ATTENDEES	JOB TITLE	SIGN-IN
1	Robby Wood	Recieving	[illegible]
2	ERIC Smith	Compounding MGR	[illegible]
3	ROBERT KULB	ANALYTICAL CHEMIST	Robert Kulb
4	Sharon Stiles	QA. MANAGER	[illegible]
5	Oscar Silva	Product D CHEMIST	Silva
6	Kevin May	QC MGR	Kevin May
7	[illegible]	TECHNICAL DIRECTOR	[illegible]
8	Miriam Unger	Q.C.	[illegible]
9	ALFREDO M. MESA	V.P. TECHNICAL	[illegible]
10	Jody Hamby	Maintenance	Jody Hamby
11	Madeline Smith	QC	Madeline Smith
12	Barry Smith	Maintenance	Barry Smith
13	CArlos conde	Production manager	[illegible]
14	PETER DUNN	PLANT MGR	Peter Dunn
15	Judy Sims	Q.C.	Judy Sims
16	Rick Cleveland	MECHANIC	Rick Cleveland

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-18-08

	ATTENDEES	JOB TITLE	SIGN-IN
1	Aracely Reyes	Production	[illegible]
2	Piedad Ramirez	Production	[illegible]
3	Leonardo H.	Production Cam Punching	[illegible]
4	Gregoria Villa	Production	[illegible]
5	Marisol Rivera	Production	M.R
6	Aura milian	Production	Aura milian
7	Enriqueta Rivera	Production	Enriqueta Rivera
8	Eugenia Alvarado	Production	[illegible]
9	Cesar Solis	Maintance	[illegible]
10	Luz Cuevas	Production	[illegible]
11	Manuel Conde	Production	[illegible]
12	Rosa Velazquez	Production	Rosa Velazquez
13	VERONICA OBANDO	Production	VERONICA O.
14	LAURA Gonzalez	Production	[illegible]
15	Rosa Gonzalez	Production	[illegible]
16	Antonio ~~[illegible]~~ Ruiz	Forklift warehouse	[illegible]

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-18-08

	ATTENDEES	JOB TITLE	SIGN-IN
1	José Garcia	Compounding	Jose [illegible]
2	Isabel Rubio	Forklift operator	[illegible]
3	Noe Herrera L.	Compounding.	Noe Herrera L.
4	Herminio Almaraz	Production Forklift -	Herminio
5	Onorio E. Rivera	Line Supervisor	[illegible]
6	Pedro Ramirez	Production W/B	[illegible]
7	José Vasquez Sorroza	Gas house operator	[illegible]
8	Cesar Solis Solis	Maintance	[illegible]
9	Lilia Gallardo	production	Lilia Gallardo
10	Carmen Hdz S	Producción	Carmen Hdz S
11	Janet Angeles	Producción	[illegible] C.
12	Nicolasa Hernandez	Produccion	
13	Maria Toto Cobix	Produccion	[illegible]
14	Andres vasquez	Produccion	Andres V.
15	Julio A. Velazquez	Produccion	[illegible]
16	Jesus Alvarez	Produccion	[illegible]

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 1/7/08

	ATTENDEES	JOB TITLE	SIGN-IN
1	Kevin May	Chemist	Kevin May
2	CHARLES AYRES	Mechanic	Chas
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HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 11/5/2007

	ATTENDEES	JOB TITLE	SIGN-IN
1	Bob McGillem Jr.	Technical Director	[signature]
2	Rick Cleveland	Plant Eng.	Richard Cleveland
3	Judy Sims	Quality Control	Judy Sims
4	Paula Hobbs	Quality Control	Paula Hobbs
5	Eric Smith	Compounding MGR	[signature]
6	BOB KULB	CHEMIST	Robert Kulb
7	Elvin Hayes	Compounding	Elvin Hayes
8	Rosmeris Mercedes	Packing	Rosm Merced
9	CRUZ M Jimenez	PACKING	[signature]
10	CArlos Conde	Production manager	[signature]
11	JAVEED SYED	Safety & Enviro.	[signature]
12	LEE MARTIN	Shipping Mgr	Lee Martin
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15			
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HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-6-07

	ATTENDEES	JOB TITLE	SIGN-IN
1	Cristina Fuentes	Supervisor.	[illegible]
2	José F. Contreras	Production	[illegible]
3	Marco Benavides.	Maintenance.	[illegible]
4	Cesar Galarza	Gas ~~House~~	C Galarza
5	Lucia Lopez S.	Production	Lucia López S.
6	Maria Ines Bonilla.	Producion	Maria Ines Bonilla.
7	Nicolasa Hernandez.	Producion	Nicolasa
8	Eugenio Alegria	Producion	Eugenio
9	Pedro Ramirez	Water bath	[illegible]
10	Omar Perea	Produitin	Omar Perea
11	Osiel Guerra	Producion	Osiel Guerra
12	Mariano Belette	Filler operator	[illegible]
13	Biviano Robles	label Operator	[illegible]
14	Miriam Unger	Q.C.	[illegible]
15	Diana Mosley	Q.C.	[illegible]
16	Sheila Osborne	Q.C.	S. Osborne

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-06-07

	ATTENDEES	JOB TITLE	SIGN-IN
1	Martha Bautista	water bath operator	Martha Bautista
2	José Garcia	Batch room	José Garcia
3	Esteban Dominguez	Production worker	[illegible]
4	Deni Rubio	Production worker	Deni Rubio
5	[illegible]	Supervisor	[illegible]
6	Noe Herrera. Lozano	Batch Room	Noe Herrera. L.
7	José Vasquez Sorrozo	Gas House.	José Vasquez
8	Julio Antonio Velazquez	Production	[illegible]
9	Gustavo Hernandez	Forklift operator	[illegible]
10	Mario Ramírez	Producción	[illegible]
11	Herminio Almanza	Forklift operator	Herminio Almanza
12	Andres Vasquez	Producción	Andres Vasquez
13	Ismael Morales	Filler operator	I Morales.
14	Jose A. Herrera	Filler operator	Jose A. Herrera
15	Gregorio Villa	Producción	[illegible]
16	Lilia Gallardo	Q.C.	Lilia Gallardo

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-06-07

	ATTENDEES	JOB TITLE	SIGN-IN.
1	Veronica Obando	Production	Veronica Obando
2	PATRICIA VASQUEZ	Production	PVas
3	Janet Angeles	Production	JANET A C.
4	Erlinda E. Madrid	Production	Erlinda E. Madrid
5	AnaRosa Castillo	Production	Ana Rosa Castillo
6	Rosa a. Lopez	Production	Rosa Lopez
7	Liza PEREZ	Production	L Perez
8	Janifer Cabrera	Production	Janifer Cabrera
9	Noami Pineda	Production	Nomi Pineda
10	Rosa Guzman	Production	Rosa GUZMAN
11	Enriqueta Rivera	Production	Enriqueta Rivera
12	YUNIER GARCIA	Production	[illegible]
13	JUAN CABALES	Production	[illegible]
14	Raidel Ortega	Production	[illegible]
15	Fidel de Dios H	Production	Fidel
16	Juan Y. Mena	Production	JMena

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-06-07

	ATTENDEES	JOB TITLE	SIGN-IN
1	Tania Cruz	Production	Tania Cruz
2	Gina Canesa	Production	[illegible]
3	Aura milian	Production	Aura milian
4	Angelica Velasco	Production	Rosa Angelica V.P.
5	Luz Cuevas	Production	Luz Cuevas
6	Aura Gonzales	Production	[illegible]
7	Diamora Sierra	Production	[illegible]
8	Carmen Hernandez	Production	Carmen Hdez S
9	Gilberto Pulido P.	Can Punchury	Gilberto Pulido Pimienta
10	Cesar Solis	Filler operator	[illegible]
11	Freddy H. Rincón	Production	[illegible] Rincon
12	Aracely Reyes	Production	Aracely Reyes
13	Alfredo pulido	Production	[illegible]
14	Marisol caseres	Production	[illegible]
15	Ismenia Maldonado	Production	[illegible]
16	Maria Hernandez	Production	maria Hernandez

HAZARD COMMUNICATION & RIGHT TO KNOW
SIGN-IN SHEET

DATE: 12-6-07

	ATTENDEES	JOB TITLE	SIGN-IN
1	Robby Wood	Receiving Mgr.	Robby Wood
2	Ralph A. Hawthorne	Maint.	[illegible]
3	Madeline Smith	~~Prod~~ Filler oper.	Madeline Smith
4	Barry Smith	Maintence Mgr.	Barry Smith
5	Marie Rina Rivera	Production	Marie Rina Rivera
6	Barry Smith	Maintance	Barry Smith
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Training for Handling Hazardous Waste and Washouts of Tanks and Production Area

Attendees	Job Description	Date	Signature
Sheila Osborne	QC	12/29/06	Sheila Osborne
FRANCIS Mannah	QC	12/29/06	[illegible]
Emma Camacho			[illegible]
Gudalope Gonzalez Rodriguez	Production		
Rosa Gonzalez	Production		
Angelica Alonso	Production		
Alba Lopez	Lab QC	12-29-06	[illegible]
Césde Solis	Production	12-29-06	[illegible]
Manuel [illegible]	Production	12/29/06	[illegible]
Alejandro Garcia	maintance	12/29/06	[illegible]
José Garcia	Batch room	12/29/06	José Garcia
JUAN MELCHOR ARCOS	Production	12-29-06	[illegible]

Training for Handling Hazardous Waste and Washouts of Tanks and Production Area

Attendees	Job Description	Date	Signature
Samuel Garcia	Supervisor	12/5/06	[illegible]
Biviano Robleco	label operator	12-5-06 B	[illegible]
Barry Smith	Maintance	12-5-06	Barry Smith
Pedro Ramirez	Waterbath operator	12.05.06	[illegible]
Felimon		12-05-06	[illegible]
Sheila Osborne	Waterbath operator Q.C.	12-05-06	Sheila Osborne
Margie Richards	Filler operator	12-05-06	Margie Richards
Jody Hamby	Maintance	12-05-06	Jody Hamby
Ernie Whitmire	Gas House	12.5-06	Ernie Whitmire
Alexis Rosa	Gas House Op.	12-05-06	Alexis Rosa
Ralph Hawthorne	Maintenance	12-05-06	[illegible]
Bolivar	Compounding	12-05-06	mas gallegos R.
Vera Burnell	Q.A. Mgr / Regulatory Affairs	12-05-06	V. Burnell

Training for Handling Hazardous Waste and Washouts of Tanks and Production Area

Attendees	Job Description	Date	Signature
Ed Yezic	Plant Mgr	12/5/06	[illegible]
Greg Russell	Compounder Supervisor	12-5-06	[illegible]
Robby Wood	Rec. Mgr.	12/5/06	Robby Wood
Carlos Conde	production M.	12/5/06	[illegible]
Drick Polynice	Analytical CHEM	12/5/06	[illegible]
Ian Farley	Analytical/Research Chem	12-5-06	[illegible]
Rick Cleveland	Gas House Supervisor	12/5/06	Rick Cleveland
Allen Price	R&D Chemist	12/5/06	W A Price II
[illegible]	R&D Chemist	12/5/6	[illegible]
Jose Garza	Compounding	12/5/06	Jose Garza
Judy Sims	QC	12/5/06	Judy Sims
Alba Lopez	QC	12/05/06	[illegible]
Noe Herrera	Compounding	12-05/06	Noe Herrera
Rosario Beiza	Filler operator	12/05/06	Rosario Beiza
Francis Manuel	QC	12/05/06	[illegible]
[illegible] Esmael	Filler operator	12/05/06	[illegible]

Training for Handling Hazardous Waste and Washouts of Tanks and Production Area

Aug. 05 – Aug. 06

Attendees	Job Description	Date	Signature
Steve Moore	Lab	8/8/05	[illegible]
Vena Burnell	Lab	8/8/05	Vena Burnell
Greg Russell	Compounding	8/8-05	Greg Russell
Jose Garcia	Compounding	8/8/05	Jose Garcia
Jos Zorroza	Compounding	8/8/05	Jose Zorroza
Justino Robles	Bust Back operator	8/8/05	[illegible]
Ruben Lopez	Filler operator	8/8/05	[illegible]
Alba Lopez	Q.C. operator	8/8/05	[illegible]
Carlos Conde	Maintance	8/8/05	[illegible]
Rosario Beiza	Filler operator	8/8/05	[illegible]
Jose Teruel	Filler operator	8/8/05	[illegible]
Ismael Morales	Filler operator	8/8/05	[illegible]
Judy Sims	Q.C. operator	8/8/05	Judy Sims
Ricardo Garcia	Gas House operator	8/8/05	[illegible]
Margie Richards	Filler operator	8/8/05	Margie Richards
[illegible] Rivera	Supervisor	8/8/05	[illegible]
[illegible]	Waste bath operator	8/8/05	[illegible]

Training for Handling Hazardous Waste and Washouts of Tanks and Production Area

Attendees	Job Description	Date	Signature
Lucia Lopez	Producción	12/29/06	Lucia L. S.
Samuel Maciano	"		
Herminio Almaraz	"		
Santos Isabel Rubio	"		
Efrain Zamora Uscanga	Producción		
Victor Hugo Rojas	Labeling		
Carlos Conde	Supervisor		

AUGUST 2012

ATTACHMENT 9

apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Apollo Industries, Inc. Smyrna, GA	
Hazardous Waste Program Table of Contents	
Section 1	Hazardous Waste Management Program Standard Operating Procedures
Section 2	Emergency Response Contact Information
Section 3	Right to Know Training Hazardous Waste Management Training Program
Section 4	RCRA Contingency Plan
Section 5	Emergency Action Plan
Section 6	Transportation of Hazardous Materials
Section 7	Forms, Log Sheets, and Drawings
Section 8	Container Markings

TRAINING OUTLINE

1. Purpose of the Program

This program is intended to provide training required in accordance with RCRA (40 CFR 264.16) for Apollo Technologies managers and other employees whose duties involve the generation, handling, storage, transport, management or disposal of hazardous waste. Any questions about hazardous waste handling should be referred to Javeed Syed, Program Manager. The information and training provided to individuals on the safe and legal management of hazardous waste will do the following:

- Protect Apollo employees from harm due to exposure to hazardous substances.
- Protect the company's environment and the environment at large.
- Protect Apollo's property.
- Protect the company from cleanup expenses resulting from accidental release of hazardous waste.
- Protect the company from legal action from local authorities, the EPA and the EPD, stemming from the incorrect handling or discharge of hazardous waste.
- Enable production and maintenance activities that generate hazardous waste to continue to operate without exposing the company to the risk of civil and criminal penalties.

2. Frequency of Training

Hazardous waste management training program is designed to ensure the applicable training is completed in a timely manner for personnel that manage, deal with, or can impact the management of hazardous waste. All new hires will be trained within the first day of employment or as soon as possible and will be trained prior to assuming any work duties involving management or handling of hazardous wastes. Training will be completed annually within the first calendar quarter of the year for all employees whom will handle hazardous waste. In addition to this annual refresher training, all new employees that work with hazardous waste will be provided hazardous waste management training as part of their new hire training, generally in conjunction with the OSHA Right-to-Know training through the Apollo Hazardous Communication Training Program (Refer to SOP SPP-051-00).

3. Levels and Types of Training

The following training matrix has been prepared identifying the various types of training that are provided based on a designated position or duty within the company. Each of the identified training elements can be trained upon either individually or as a group of training material.

Apollo Training Matrix

Training element	Environmental manager	Production supervisor	Maintenance supervisor	Gen. plant worker	Gen. office personnel	Chemical compounder/manager	Filling machine operator	Laboratory technician/manager	Gas room operator	Maintenance mechanic	Quality control technician	Quality control manager
	Job position											
Hazardous waste management procedures training												
Accumulation (satellite/90 day)	√	√	√			√	√	√	√	√	√	√
Container/tank management	√	√	√			√	√	√	√	√	√	√
Hazardous waste regulations	√	√										√
Inspections	√	√	√			√	√	√		√		√
Making waste determinations	√	√										√
Pre-transportation (manifests/labels)	√	√	√			√						√
Properties of facility wastes	√	√	√	√	√	√	√	√	√	√	√	√
Reporting and recordkeeping	√	√	√			√						√
Waste minimization	√	√	√			√	√	√	√	√	√	√
Waste packaging	√	√				√	√	√				√
Emergency response training												
Communications, alarms, and evacuation routes	√	√	√	√	√	√	√	√	√	√	√	√
Contingency plan implementation /emergency response procedures	√	√	√			√	√	√	√	√		√
Site shutdown procedures	√	√	√			√	√	√	√	√		√

Apollo Personnel Classifications

Environmental manager is responsible for the overall hazardous waste management functions at the facility.

Production supervisor is responsible for production activities; supervises staff that are hazardous waste generators.

Maintenance supervisor is responsible for maintenance activities; supervises staff that are hazardous waste generators and has some environmental management responsibilities.

General plant worker generates no hazardous waste and has no direct contact with physical hazardous waste activities.

General office personnel are responsible for general administrative and clerical activities but no hazardous waste functions.

Chemical compounder/manager is responsible for all batch room activities, storage tank farms, inventorying/ cycle counting all chemicals and unloading bulk chemicals.

Filling machine operator is responsible for running, changing over, setting up and maintaining the filling machine.

Laboratory technician/manager is responsible for testing batches, maintaining records, MSDSs, COAs and testing all incoming chemicals.

Gas room operator is responsible for operating, setting up and maintaining the gassers, and also responsible of turning on and off the transfer valves, on the propellant tanks.

Maintenance mechanic is responsible for repairs, trouble shooting, fabricating, and helping with the set up of the production lines and general equipment maintenance.

Quality control technician is responsible for checking and recording of data, during the runs. This position also makes certain that finished products meet all specifications per the BOM; and also makes certain that the company's SOP, relevant to quality, are met.

Quality control manager is responsible for all activities of QC technicians and for issuing MSR (Materials Status Report), for non conformance.

4. Types of Hazardous Waste

A hazardous waste is a solid, liquid or solid material identified in 40 CFR 261 that is a "Characteristic Waste" with one or more of the following descriptions:

- Ignitable (a liquid with a flashpoint less than 141°F, a spontaneously combustible solid, an ignitable compressed gas or an oxidizer), or;
- Corrosive (an aqueous solution with a pH below 2.0 or above 12.5) a liquid which corrodes steel at a rate of 0.25 inches per year, or;
- Reactive (an unstable material, reacts with water, explosive, generates toxic gas or a cyanide or sulfide bearing waste), or;
- Toxic (RCRA metals such as chromium, lead, silver, mercury, cadmium; or pesticides, organic solvents, chlorinated solvents); and
- Is discarded, has served its intended use or is a manufacturing by-product, and;
- That is not domestic sewage, a household waste or a sample collected for testing.

5. Hazardous Wastes Generated at Apollo

Hazardous wastes are generated in the following areas, among others and may include:

- Batch room (water and solvents from cleaning mixing tanks, hoses and pumps).
- Filling rooms (water and solvents for cleaning out filling bawls and drip trays).
- Storage tank farms (water, solvents)
- Water bath (water, solvents)
- Laboratories (organic residues and organic solvents).
- Maintenance and Operations Activities (filters, hydraulic oils).
- Electrical Maintenance (burned-out fluorescent and mercury vapor lights).

Refer to the SOP PRP-407 Product and Material Recovery for information on when recovered product is determined to be a hazardous waste and Log 400j Hazardous Waste Stream Assessment for a complete listing of all designated solid and hazardous waste streams.

6. Where Hazardous Wastes Are Stored

Solid hazardous waste (contaminated rags, spent mop heads, filters, etc) is accumulated in Satellite Accumulation Areas (SAA) at each production line and in the batch/compound room. This waste is then transferred to 55-gallon drums located at a designated less than 90-day storage area.

Liquid Hazardous waste is accumulated at Satellite Accumulation Areas for temporary accumulation (designated 55-gallon drums) in designated hazardous waste storage drums located in the production area, then transferred to less than 90-day Hazardous Waste Storage Tank (ST-45) for offsite disposal. Refer to Apollo SOP PRP-400-02 – Storage and Handling of Hazardous Waste for specific instructions on the operational procedures associated with each of the hazardous waste locations.

Satellite Accumulation Areas (SAA) are areas where wastes are collected, typically a five-gallon self-closing metal pail, and temporarily stored at the point of generation then transferred to the hazardous waste storage drums. Examples of wastes collected this way are organic residues and solvents and laboratory solutions. Up to 55 gallons of hazardous waste or one quart of acutely hazardous waste may be accumulated for any length of time until the container is full at the Satellite Accumulation Area. The area must be clearly marked as a Hazardous Waste and secured or separated from the normal laboratory or work area. Collection containers must always be securely closed except during the act of filling. It is the responsibility of the person whose activity generates the waste or of the appropriate laboratory professional to assure that the SAA container is emptied into the Hazardous Waste Storage drums within three days of filling a container or at the end of the production run or prior to allowing the container to becoming full. If a person wishing to dispose of a surplus hazardous substance as waste does not have training and access to a Main Hazardous Waste Storage Area, he or she must ask a trained person, for assistance or access. For additional information, the EPA's Office of Solid Waste has published an article entitled "Frequently Asked Satellite Accumulation Area Questions available at http://www.epa.gov/osw/specials/labwaste/memo-saa.htm.

Hazardous Waste Storage Areas at Apollo: Liquid hazardous waste may be accumulated in containers not to exceed 55-gallon drums (SAA drums) located at each production line or within the compounding room. Hazardous waste is stored in AST ST-45 located in the storage tank farm, next to the bulk liquid unloading area. The accumulation drums and tank are identified as a Hazardous Waste. The waste management tank and associated transfer piping and pump systems must be inspected daily by the Environmental Manager, a laboratory professional or other trained, qualified person for leaks, proper segregation of chemicals and proper labeling. A log sheet (From 400g) is provided for each hazardous waste storage area to keep a record of these weekly inspections as required by EPA and GA EPD regulations. Bulk collection containers must have an EPA-approved label on the side, filled out as described below.

7. How Hazardous Wastes Are Labeled

Bulk collection containers must have a Hazardous Waste Label affixed to the side. Before any waste is put into a bulk waste container, the following information must be entered on the label in the appropriate spaces.

- The wording "Hazardous Waste"
- Information/Identification of the waste (e.g. Waste Liquid Solvent)
- The full address and name of the company, housing the waste.
- The EPA ID Number for the company. EPA identification numbers for Apollo Technologies is: GAD051021285

8. How Long Hazardous Wastes Can Be Stored

Bulk wastes may be stored up to but less than 90 days from the time the container is filled (ASD). The Safety/Environmental Manager schedules regular removal of wastes to conform to this storage time restriction. Hazardous waste that is accumulated within appropriately designated SAA can be stored until 55-gallons of waste have been accumulated. At such point of accumulation, the full container is required to be marked with an ASD and then properly transported off-site within 90-days of the ASD. It is Apollo policy (SOP PRP-406) that SAA waste will be routinely emptied into a designated less than 90-day accumulation drum to avoid having any extended periods of time for SAA accumulation. .

9. Response to a Spill or other Incident Involving Hazardous Wastes

Any leak or spill must be immediately reported to the Safety/Environmental Manager and Supervisor and it must be taken care of immediately, by a team of employees that have been trained how to handle hazardous waste. The team will be put together by the Chemical Compounding Room Supervisor. The spilled waste must be placed in a container and labeled appropriately, for easy identification. All chemical and waste containers are properly labeled and easily identified by sight so the Safety/Environmental Manager or other trained person can assess the source, amount, and extent of a released material by visual inspection. Precautions such as daily inspections and use of secondary containers have been taken to minimize the potential for a spill. If a spill occurs, the first person on the scene should immediately contact the Safety/Environmental Manager or other qualified person will inspect the spill area and assesses the quantity spilled, determine the identity of the spilled material, and assess the potential for migration of the spill. Refer to SOP PRP-402-01 Response to Spills.

10. Cleanup of Minor Spills by Apollo Technologies Personnel if Permitted by Law

For very small, minor leaks or spills, or spills of nonhazardous substances, Apollo Technologies is equipped with the following tools, engineering controls, emergency cleanup materials and personal protective equipment:

- Spill Pillows for soaking up minor sills of solvents, oils, acids and bases;
- Pails of loose absorbent material for soaking up spills of solvents, oils, acids and bases;
- Pails of granular sodium carbonate for absorbing and neutralizing spilled acids;
- Shovels and scoops for dispensing absorbent materials and sodium carbonate;
- Empty pails and drums for containing absorbent material used to soak up spills;
- Vinyl, latex and neoprene gloves;
- Eye wash station;
- Exhaust ventilation;
- First aid kit;
- Chemical splash goggles; and
- Fire Extinguishers.

If the spill is determined by someone trained in hazardous waste management to be minor (such as a small leak or small spill) and not a threat to the life, health or well-being of any individual, and does not produce any toxic or irritating vapors, then the following cleanup procedure may be carried out: If there is any doubt as to the severity of the incident, then notify the Safety/Environmental Manager or the Plant Manager.

The contaminated area is roped off or otherwise protected from unauthorized entry. Absorbent is spread around the leaking container in sufficient quantity to absorb and contain the leaking material.

The spent absorbent medium is placed with scoops into a DOT-approved open head steel or plastic drum, whichever is appropriate for containing the spilled material. The drum must have a HAZARDOUS WASTE label on its side with Apollo's name, street address, Apollo's EPA identification number, date the barrel was filled, and a complete chemical description of the waste inside. The barrel must be stored at the Hazardous Waste Storage Area prior to off-site disposal by a licensed hazardous waste handler.

Contaminated surfaces are cleaned with a non-toxic solvent or water-soluble cleaner and the contaminated cleaning supplies placed in the barrel with the bulk of the absorbed spill.

11. Removal of Hazardous Waste from Apollo's Premises

Hazardous waste and unneeded excess chemicals may only be removed from Apollo's premises by a licensed vendor. The Safety/Environmental Manager makes arrangements for pickup and disposal at regular intervals before the material exceeds the legal storage time. The Safety/Environmental Manager announces removal dates in advance. Original copies of hazardous waste manifests are on file in the Safety/Environmental Manager's office.

12. Documentation of Training

Hazardous waste training will be documented in the company files which will identify the name of the person trained, their position and/or job duties, date of their training, and their signature confirming their participation in the training. All employees will acknowledge receipt of training by completing a training sign-in sheet (Form 400h or equivalent).

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Hazardous Waste Management Training Program

Form 400h

APOLLO TECHNOLOGIES/ HAZARDOUS WASTE TRAINING
Sign-In Sheet

NAME	**JOB TITLE**	**TYPE OF TRAINING**	**SIGNATURE**

TRAINER NAME/SIGNATURE: DATE:

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PRODUCTS TO FILL ESSENTIAL NEEDS

Apollo Industries Hazardous Waste Management Training Program

TRAINING OUTLINE

1. Proposito del Programa

Este programa tiene como objetivo proporcionar la formación necesaria de acuerdo con la RCRA (40 CFR 264.16) para los administradores de tecnologías de Apollo y otros empleados cuyas obligaciones impliquen la generación, manipulación, almacenamiento, transporte, manejo o disposición final de residuos peligrosos. Cualquier pregunta sobre el manejo de residuos peligrosos deben ser remitidos a Javeed Syed, Administrador de programas. La información y formación proporcionada a los individuos sobre la gestión segura y legal de los residuos peligrosos hará lo siguiente:

- Proteger a los empleados del Apollo de daños debidos a la exposición a sustancias peligrosas.
- Proteger el medio ambiente de la empresa y el medio ambiente en general.
- Proteger la propiedad de Apollo.
- Proteger a la empresa de los gastos resultantes de la limpieza de liberación accidental de residuos peligrosos.
- Proteger a la empresa de la acción legal de las autoridades locales, la EPA y la EPD, derivadas de la manipulación incorrecta o descarga de residuos peligrosos.
- Permitir que las actividades de producción y mantenimiento que generan residuos peligrosos a seguir funcionando sin exponer a la empresa al riesgo de sanciones civiles y penales.

2. Frequencia de entrenamiento

Gestión de residuos peligrosos programa de formación está diseñado para garantizar la formación aplicable se completa en el momento oportuno para el personal que gestiona, tratar, o puede afectar a la gestión de los residuos peligrosos. Todos los nuevos empleados serán capacitados en el primer día de trabajo, o tan pronto como sea posible y será entrenado antes de asumir las tareas de trabajo relacionadas con la gestión o manejo de los desechos peligrosos. La formación se completa anualmente dentro del primer trimestre del año para todos los empleados que se encargará de los residuos peligrosos. Además de esta capacitación anual de actualización, todos los nuevos empleados que trabajan con residuos peligrosos se proporcionará capacitación manejo de desechos peligrosos como parte de su entrenamiento para nuevos empleados, generalmente en conjunción con la OSHA Derecho a Saber de la formación a través del Programa Apollo Entrenamiento en Comunicación (Consulte la SOP SPP-051-00).

3. Tipos y Niveles de Educacion

La matriz siguiente entrenamiento se ha preparado la identificación de los distintos tipos de formación que se ofrecen sobre la base de una posición designada o servicio dentro de la empresa. Cada uno de los elementos de formación identificadas pueden ser entrenados en ya sea individualmente o como un grupo de material de formación.

Apollo Entrenamiento Matrix

Elemento de Formacion	Gerente Ambiental	Supervisor producción	Supervisor de Mantenimiento	Obrero de Planta Gen.	Personal de Oficina Gen.	Químico Mezclador / Gerente	Operador de Maquina de Llenado	Laboratorio Técnico / Administrador	Operador de Cuarto de Gases	Mecanico de Mantenimiento	Tecnico de Control de Calidad	Gerente de Control de Calidad
La gestión de residuos peligrosos procedimientos de entrenamiento												
Acumulación (satellite/90 día)	√	√	√			√	√	√	√	√	√	√
Gestion de Contenedor / tanque	√	√	√			√	√	√	√	√	√	√
Regulaciones de desechos peligrosos	√	√										√
Inspecciones	√	√	√			√	√	√		√		√
Realizar determinaciones de residuos	√	√										√
Realizar determinaciones de residuos	√	√	√			√						√
Propiedades de los desechos de las instalaciones	√	√	√	√	√	√	√	√	√	√	√	√
Presentación de informes y mantenimiento de registros	√	√	√			√						√
Minimización de residuos	√	√	√			√	√	√	√	√	√	√
Envase de Residuos	√	√				√	√	√				√
Entrenamiento de Respuesta de Emergencia												
Comunicaciones, alarmas, y rutas de evacuación	√	√	√	√	√	√	√	√	√	√	√	√
Plan de contingencia de ejecución / procedimientos de respuesta de emergencia	√	√	√			√	√	√	√	√		√
Procedimiento de apagado de planta	√	√	√			√	√	√	√	√		√

Puesto de Trabajo (column group heading over the job positions)

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Apollo Industries Hazardous Waste Management Training Program

Apollo Personnel Classifications

Gerente de Medio Ambiente es responsable de las funciones generales de gestión de residuos peligrosos en la instalación.

Supervisor de producción es responsable de las actividades de producción, supervisa al personal que son los generadores de residuos peligrosos.

Supervisor de mantenimiento es responsable de las actividades de mantenimiento. supervisa al personal que son generadores de residuos peligrosos y tiene algunas responsabilidades de gestión ambiental.

Trabajador de planta general no genera residuos peligrosos y no tiene contacto directo con las actividades fisicas de desechos peligrosos.

Personal de oficina en general son responsables de las actividades generales administrativas y de oficina, pero las funciones de desechos peligrosos.

Mezclador químico / gerente es responsable de todas las actividades de las habitaciones de lotes, granjas de tanques de almacenamiento. inventario / inventario cíclico todas las sustancias químicas y descarga de productos químicos a granel.

Operador de máquina de llenado es responsable de ejecutar, cambiando otra vez, la creación y el mantenimiento de la máquina de llenado.

Técnico de laboratorio / gerente es responsable del control de los lotes, el mantenimiento de registros, MSDS. COA y probar todas las sustancias químicas entrantes.

Operador de cuarto de Gases es responsable de la operación, la creación y el mantenimiento de los gase. y también se encarga de encender y apagar las válvulas de transferencia, en los tanques de combustible.

Mecánico de mantenimiento es responsable de las reparaciones. resolución de problemas, la fabricación, y ayudar con la puesta en marcha de las lineas de producción y mantenimiento de equipos en general.

Técnico de control de calidad se encarga de comprobar y el registro de datos, durante las carreras. Esta posición también se asegura de que los productos terminados cumplen todas las especificaciones por la lista de materiales, y también se asegura de que SOP de la compañía. correspondiente a la calidad, se cumplen.

Gerente de control de calidad es responsable de todas las actividades de los técnicos de control de calidad y para la expedición de MSR (Informe de estado de Materiales). por no conformidad.

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4. Tipos de Residuos Peligrosos

Un residuos peligrosos es un material sólido, líquido o sólido en el 40 CFR 261 que es un "Residuo Característico" con una o más de las siguientes descripciones:

• Inflamable (un líquido con un punto de inflamación inferior a 141 ° F, un sólido espontáneamente combustible, un gas comprimido inflamable o un oxidante), o;

• Corrosivo (una solución acuosa con un pH por debajo de 2,0 o por encima de 12,5) un líquido que corroe el acero a una velocidad de 0,25 centímetros por año, o;

• Reactivo (un material inestable, reacciona con el agua, explosivo, genera gas tóxico o un cojinete de residuos de cianuro o sulfuro), o;

• Tóxicos (RCRA metales como el cromo, plomo, plata, mercurio, cadmio, o pesticidas, disolventes orgánicos, disolventes clorados), y

• se descarta, ha servido como su uso o es un subproducto de fabricación, y;

• Que no son las aguas residuales domésticas, un residuo doméstico o una muestra para su análisis.

5. Desechos Peligrosos Generados en Apollo

Los residuos peligrosos que se generan en las siguientes áreas, entre otras, y pueden incluir:

• Batch ambiente (agua y disolventes de limpieza de tanques de mezcla, mangueras y bombas).

• Cuarto de llenado (agua y disolventes para la limpieza de berrea de llenado y bandejas de goteo).

• Tanque de almacenamiento (agua, disolventes)

• Baño de agua (agua, disolventes)

• Laboratorios (residuos orgánicos y disolventes orgánicos).

• Actividades de Mantenimiento y Operaciones (filtros, aceites hidráulicos).

• Mantenimiento Eléctrico (quemado fluorescentes y luces de vapor de mercurio).

Consulte el SOP PRP-407 Producto y Recuperación del material para obtener informacion sobre cuándo producto recuperado se determina que es un residuo peligroso y Log 400J Evaluación de Residuos Peligrosos para obtener una lista completa de todos los flujos de residuos sólidos y peligrosos designados.

6. ¿Donde se almacenan los Desechos Peligrosos

Los residuos sólidos peligrosos (trapos contaminados, pasaron los trapeadores, filtros, etc) se acumula en áreas de acumulación satélite (SAA) en cada línea de producción y en la sala de lote / compuesto. Estos residuos se transfiere entonces con 55-galones situados en un área de almacenamiento designada menos de 90 días.

Los residuos peligrosos líquidos se acumula en áreas de acumulación satélite para la acumulación temporal (designados tambores de 55 galones) en bidones de residuos peligrosos designados para guardar ubicados en el área de producción, y luego transferidos a menos de 90 días Peligrosos Tanque de Almacenamiento de Residuos (ST-45) para fuera de la oficina disposición. Consulte Apolo SOP PRP-400-02 - Almacenamiento y Manejo de Residuos Peligrosos para obtener instrucciones específicas sobre los procedimientos operacionales asociados a cada uno de los lugares de desechos peligrosos.

Áreas de satélite de acumulación (SAA) son áreas donde los residuos son recogidos, típicamente una de cinco galones de cierre automático lata metálica, y se almacena temporalmente en el punto de generación transfiere entonces a los tambores de almacenamiento de residuos peligrosos. Ejemplos de residuos recogidos de esta manera son los residuos orgánicos y solventes y soluciones de laboratorio. Hasta 55 galones de desechos peligrosos o un cuarto de galón de desechos sumamente peligrosos podrá acumularse durante un período de tiempo hasta que el recipiente esté lleno en el área de acumulación satélite. El área debe estar claramente marcado como residuos peligrosos y fijar o separado de la normal de laboratorio o área de trabajo. Contenedores de recogida debe estar siempre bien cerrada excepto durante el acto de llenar. Es responsabilidad de la persona cuya actividad genera los residuos o del laboratorio profesional adecuado para asegurar que el contenedor de SAA se vacía en los tambores de almacenamiento de residuos peligrosos dentro de los tres días de llenado de un recipiente o en el final de la campaña de producción o antes permitiendo que el recipiente para que se llene. Si una persona que desee disponer de un excedente de sustancia peligrosa como residuo no tiene la capacitación y el acceso a la principal zona de almacenamiento de residuos peligrosos, él o ella debe hacer una persona capacitada, para la asistencia y acceso. Para obtener información adicional, la Oficina de la EPA de los Residuos

Sólidos ha publicado un artículo titulado "Preguntas más frecuentes área de acumulación satélite disponibles en http://www.epa.gov/osw/specials/labwaste/memo-saa.htm.

Las áreas de almacenamiento de residuos peligrosos en el Apolo: residuos peligrosos líquidos pueden acumularse en contenedores que no exceda de 55 galones (tambores SAA) ubicadas en cada línea de producción o en la sala de composición. Los residuos peligrosos se almacenan en AST ST-45 situado en el patio de tanques de almacenamiento, al lado de la zona de descarga de líquidos a granel. Los tambores de acumulación y el tanque se identifican como residuos peligrosos. El depósito de la gestión de residuos y de la tubería de transferencia asociada y sistemas de bombeo deben ser inspeccionados diariamente por el Gerente de Medio Ambiente, un laboratorio profesional u otra persona entrenada, calificada por las fugas, la segregación adecuada de los productos químicos y el etiquetado apropiado. Una hoja de registro (A partir de 400 g) se proporciona para cada zona de almacenamiento de residuos peligrosos para mantener un registro de estas inspecciones semanales requeridos por la EPA y las regulaciones GA EPD. Granel contenedores de recogida debe tener una etiqueta aprobada por la EPA en el lado, completado como se describe a continuación.

7. ¿Como los Desechos Peligrosos han sido Etiquetaos

Los contenedores para graneles recogida deberán disponer de una etiqueta de Residuos Peligrosos colocada en el lateral. Antes de que los residuos se ponen en un recipiente de residuos a granel, la siguiente información debe incluirse en la etiqueta, en los espacios correspondientes.

- La expresión "residuos peligrosos"
- Información / Identificación de los residuos (por ejemplo, Residuos líquidos disolventes)
- La dirección completa y el nombre de la empresa, que alberga los residuos.
- El número de identificación de la EPA para la empresa. Números de identificación de la EPA para las Tecnologías Apolo es: GAD051021285

8. ¿Cuanto tiempo los Desechos Peligrosos se pueden almacenar

Desechos a granel se pueden almacenar hasta, pero menos de 90 días a partir del momento en que el recipiente está lleno (ASD). La Seguridad / Medio Ambiente Gerente de horarios regulares de eliminación de residuos para cumplir con esta limitación en el tiempo de almacenamiento. Los residuos peligrosos que se acumula dentro apropiadamente designada SAA se pueden almacenar hasta 55-galones de residuos se han acumulado. A tal punto de acumulación, el recipiente lleno debe estar marcado con un ASD y luego transportado correctamente fuera de las instalaciones dentro de los 90 días de la ASD. Es Apollo política (SOP PRP-406) que los residuos de SAA se rutinariamente vaciarse en un tambor de acumulación designado menos de 90 días para evitar tener períodos prolongados de tiempo para la acumulación de SAA.

9. Respuesta a un Derrame o Incidente que involucre los Desechos Peligrosos

Cualquier fuga o derrame debe ser reportado inmediatamente a la Seguridad / Supervisor y Gerente Ambiental y debe ser atendido de inmediato, por un equipo de empleados que han sido entrenados como manejar los residuos peligrosos. El equipo será elaborado por el Supervisor Químico Sala de capitalización. Los residuos vertidos se coloca en un recipiente con una etiqueta adecuada, para una fácil identificación. Todos los recipientes de productos químicos y residuos están correctamente etiquetados y fáciles de identificar a simple vista por lo que la seguridad / Gerente de Medio Ambiente u otra persona entrenada puede determinar la fuente, cantidad y extensión de un material publicado por inspección visual. Precauciones tales como inspecciones diarias y el uso de envases secundarios se han tomado para minimizar la posibilidad de un derrame. Si ocurre un derrame, la primera persona en la escena debe comunicarse inmediatamente con la Seguridad / Gerente Ambiental u otra persona calificada inspeccionará el área del derrame y se evalúa la cantidad derramada, determine la identidad del material derramado, y evaluar el potencial de la migración de la derramarse. Consulte SOP PRP-402-01 Reacción Derrames.

10. La limpieza de Derrames menores por Personal de Apollo Technologies si esta permitido por ley

Por muy pequeñas, pequeñas fugas o derrames, o derrames de sustancias peligrosas, Apollo Technologies está equipado con las siguientes herramientas, controles de ingeniería, materiales de limpieza de emergencia y equipos de protección personal:

• Almohadas para absorber derrames menores umbrales de disolventes, aceites, ácidos y bases;

• Cubos de material absorbente suelto para absorber los derrames de solventes, aceites, ácidos y bases;

- Cubos de carbonato de sodio granular para absorber y neutralizar los ácidos derramados;
- Palas y cucharas para dispensar materiales absorbentes y carbonato de sodio;
- Cubetas vacias y tambores para contener material absorbente utilizado para absorber los derrames;
- Guantes de vinilo, látex y neopreno;
- Ojo estación de lavado;
- Ventilación de escape;
- Botiquín de primeros auxilios;
- gafas de proteccion, y
- Extintores.

Si el derrame es determinada por una persona capacitada en el manejo de residuos peligrosos a ser de menor importancia (como una pequeña fuga o derrame pequeño) y no una amenaza para la vida, la salud o el bienestar de cualquier persona, y no produce ningún tóxico o irritante vapores, entonces el siguiente procedimiento de limpieza puede llevarse a cabo: si existe alguna duda en cuanto a la gravedad del incidente, y luego notificar a la Seguridad / Gerente Ambiental o Gerente de Planta.

El área contaminada acordonada o de otra manera protegida contra acceso no autorizado.

Absorbente se extiende alrededor del recipiente de la fuga en cantidad suficiente para absorber y contener el material fugas.

El medio gastado absorbente se coloca en tambores de acero aprobado por DOT abierto o el tambor plástico, lo que sea apropiado para contener el material derramado. El tambor debe tener una etiqueta RESIDUOS PELIGROSOS en su lado con el nombre de Apollo, dirección, número de identificación de la EPA de Apollo, la fecha, el barril estaba lleno, y una descripción completa del producto químico en el interior de los residuos. El barril debe ser almacenado en el área de almacenamiento de residuos peligrosos antes de su eliminación fuera del sitio por un manejador de residuos peligrosos autorizado.

Las superficies contaminadas se limpian con un limpiador disolvente no tóxico o solubles en agua y los suministros de limpieza contaminados en el cañón con la mayor parte del derrame absorbido.

11. La eliminacion de Residuos Peligrosos de los locales de Apollo

Los residuos peligrosos que no sean necesarios y exceso de productos químicos sólo podrán ser removidos de las instalaciones de Apolo por un proveedor autorizado. La Seguridad / Gerente Ambiental hace arreglos para la recolección y disposición a intervalos regulares antes de que el material exceda el tiempo de almacenamiento legal. La Seguridad / Gerente Ambiental anuncia las fechas de eliminación de antemano. Las copias originales de los manifiestos de residuos peligrosos se encuentran archivados en la oficina de la Seguridad / Gerente Ambiental.

12. Documentacion de Educacion

Formación de residuos peligrosos serán documentados en los archivos de la empresa, que identificarán el nombre de la persona entrenada, su posición y / o deberes del trabajo, la fecha de su formación, y su firma confirmando su participación en la formación. Todos los empleados acusará recibo de entrenamiento completando una sesión de entrenamiento hoja (Formulario 400h o equivalente).

APOLLO TECHNOLOGIES/ FORMACIÓN DE RESIDUOS PELIGROSOS
Hoja de Registro

NOMBRE	TITULO	TIPO DE FORMACION	FRIMA

ENTRENADOR Nombre / Firma:

DIA:

Apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

Apollo Industries
Hazardous Waste Management Program

Purpose: The purpose of this program is to provide instruction for the proper management of hazardous wastes in accordance with federal, state, and local requirements.

Applicability: This program applies to any facility employee or contractor engaged in generating, handling, or accumulating hazardous wastes, or responsible for arranging for the pick-up and disposal of hazardous wastes. This procedure incorporates requirements set forth in 40 CFR 265 as well as Georgia regulation 391-3-11-.08.

Scope: This procedure applies to all Apollo manufacturing locations that generate a hazardous waste as defined in this procedure.

Definitions:

Accumulation Start Date *is the date in which a waste is first placed in a container to assure that waste is not stored beyond regulatory time limits (90 days for LQG, 180 days for SQG, and 1 year for CESQG). An ASD is not marked onto SAA drums until they become full containers.*

CESQG *is a conditionally exempt small quantity generator of hazardous waste generating less than 220 lb of hazardous waste in a month.*

Hazardous waste *is waste that is dangerous or potentially harmful to health. Hazardous wastes can be liquids, solids, gases, or sludges. They can be discarded commercial products, like cleaning fluids or pesticides, or the by-products of manufacturing processes.*

Listed hazardous wastes are specifically defined by US EPA based upon their potentially toxic or dangerous properties which are commonly generated through solvent use (F codes), and through commercial grade chemical disposal (P and U codes).

When a waste is not a listed hazardous waste but still exhibits a characteristic of ignitability (D001), corrosivity (D002), reactivity (D003), or toxicity (D004-D039) it is called a characteristic hazardous waste.

LQG *is a Large Quantity Generator of hazardous waste generating more than 2,200 lbs of hazardous waste in a month.*

Satellite Accumulation Area (SAA) *is when hazardous waste is managed at or near the point of generation, prior to moving it to a separate waste accumulation point.*

Standard Operating Procedures (SOP) *are used by Apollo to provide work instructions and management techniques associated with specific activities or materials.*

SQG *is a small quantity generator of hazardous waste generating more than 220 lbs but less than 2,200 lbs of hazardous waste in a month.*

TCLP *(toxicity characteristic leaching protocol) is an analytical test performed on a waste to determine if it is a hazardous waste.*

Universal waste *is a special type of hazardous waste which has less stringent management requirements. This includes non-alkaline batteries, pesticides, and mercury-containing equipment and lamps. Refer to Apollo's Universal Waste Management Program.*

Responsibilities: The facility Environmental Manager and Shift Managers (or their designee) are responsible for implementing the requirements of this program.

Procedures: The following procedures shall be used with regard to determination and management of hazardous wastes. Recovered products and materials are to be managed in accordance with the Apollo **SOP PRP-407-00 Product and Material Recovery**.

1. Hazardous Waste Determination

All waste streams must be evaluated to determine if they are hazardous or non hazardous waste. An evaluation may consist of:

- testing the waste material using TCLP analysis;
- using generator knowledge (e.g. MSDS, similar waste at another Apollo facility, common knowledge, etc.); or
- identification of the material as a listed hazardous waste (e.g. certain spent laboratory reagents/chemicals, certain spent solvents)

The waste determination shall be written and clearly document:

- The date the determination was made or updates;
- Basis for the determination (e.g. MSDS, similar waste at another Apollo facility, common knowledge, etc.)

A "waste profile" from a third-party waste vendor can serve as a waste determination provided that it clearly documents why the waste is hazardous or non-hazardous. Waste determinations shall be reviewed and updated when the waste stream properties change.

The hazardous materials waste stream assessment tracking log (**Apollo Log 400j**) will be used to document waste determinations.

2. Identified Hazardous Wastes

The following items have been identified as hazardous wastes at Apollo facilities based upon generator knowledge and analysis, additional waste streams may be present that are yet to be added to this list as new processes or activities are implemented.

- Spent or Waste Products
- Waste Solvents from fill/transfer line flushing
- Spent Rags/mop heads used for line production area cleanup
- Waste cleaning solvent from printing heads at Line Coaters
- Waste HPLC liquids (QC Lab)
- Un-punctured waste aerosol cans

3. Identified Non-Hazardous Wastes

The following are not hazardous wastes unless mixed with or contaminated by other waste streams:

- Spent rags used only for oil residue cleanup
- Wastewater from Aerosol test baths (no contaminants)
- Scrap metal
- General municipal solid waste (office and cafeteria trash)
- Waste cardboard, aluminum cans, plastic wrapping, paper
- Mop water (from non-solvent water based cleanup operations)

The following waste streams commonly generated at Apollo facilities are not hazardous wastes, but have specific management requirements and are addressed under separate SOPs:

- Used Oil including motor, hydraulic, and lubricating (Refer to **Apollo Used Oil and Oil Filter Management Program**)
- Waste mercury containing lamps (fluorescent, HID, metal halide, etc.)
- Waste pesticides (material that cannot be re-used in product formulations)
- Spent lithium ion, metal halide, or other non-alkaline dry cell batteries (manage as universal waste)

4. Hazardous Waste Accumulation and Storage

- Size your hazardous waste accumulation containers (up to 55-gallons) for the quantity of waste expected to be generated
- Do not combine hazardous waste with non-hazardous wastes.

- All hazardous waste containers shall remain closed except when adding or removing waste.
- Containers of liquid waste or liquid hazardous waste shall be stored on secondary containment.
- Never store more than 55-gallons of hazardous waste at a satellite accumulation point.
- Containers of hazardous waste shall be inspected weekly using the attached Hazardous Waste Inspection Form (**Apollo Form 400g**).
- Have an appropriately sized and outfitted spill kit nearby capable of addressing spills from the hazardous waste container.
- Refer to **SOP PRP-400-02 - Storage and Handling of Hazardous Waste**

5. <u>Hazardous Waste Labeling</u>

Clearly label the hazardous waste accumulation container with the words "hazardous waste" and the contents of the container (e.g. Hazardous Waste –Waste Solvent).

When the hazardous waste is first placed in the container, apply the calendar date (ASD) onto the container label.

If utilizing a satellite accumulation area, the ASD is only placed on the drum when the container becomes full (no more than 55-gallons allowed). Move the dated container to your standard storage area within three days of marking the ASD or empty the waste into the designated less than 90-day storage container.

6. <u>Waste Disposal and Shipping</u>

The Environmental Manager (or his/her designee) shall coordinate for proper hazardous waste disposal. Refer to **SOP PRP-400-02 - Storage and Handling of Hazardous Waste.**

Hazardous waste shall be picked up by a third party hazardous waste disposal company having the appropriate permits and/or registrations to accept the waste and documented using a hazardous waste manifest and land disposal restriction notice.

Manifests: The proper waste codes and shipping names must be located on each manifest. Refer to the waste stream characterizations and profiles for additional details.

7. <u>Training</u>

All Apollo employees will receive basic level training through Apollo's Hazardous Communication Training (**SPP-0510-00**) and additional hazardous waste training will be provided to employees based on their job function and duties. Apollo has developed a Hazardous Waste Training Program that specifies the content of the training and the types of training to be provided to each designated job function. All training will be documented using **Apollo Form 400-h**.

8. Hazardous Waste Inspections

Apollo will assure that at a minimum the following items will be inspected weekly at each designated less than 90-day hazardous waste accumulation area and will also perform identical inspections to each designated SAA.

- Is secondary containment storage area free of spills or containment leaks?
- Are all containers properly labeled with hazard contents?
- Are all containers in good condition? (no rusting or defective containers)
- Are all container tops free of spillage?
- Are incompatible containers segregated?
- Is aisle spacing adequate to allow inspection of all sides?
- Are all containers with liquids stored in secondary containment?
- Are all containers sealed with tight-fitting lids / bungs?
- Are all less than 90-day hazardous waste containers marked with as ASD?
- Is all waste disposed of within 1 year for a CESQG, 180 days for a SQG, or 90 days for a LQG, of the accumulation start date?

Apollo may utilize inspection **Form 400f** and **Form 400g** for documentation of the hazardous waste inspections or an alternate form as long as all of the required inspection elements identified above have been assessed as part of the inspection. The less than 90-day hazardous waste storage tank (ST-45) at the Smyrna facility will be inspected daily using inspection **Form 400a**.

References:

SOP PRP-400-02 Storage and Handling of Hazardous Waste
SOP PRP-407-00 Product and Material Recovery
SOP PRP-406-00 Response to Spills
Form 400a Hazardous Waste Tank System Inspection Log
Form 400f Daily Solid Waste Inspection Log
Form 400g Hazardous Waste Weekly Inspection Log
Form 400h Hazardous Waste Management Training Program Log
Form 400i Waste Stream Assessment Log

PRP-400-02

Storage and Handling of Hazardous Waste (Overview)

Scope: The procedures associated with the storage and handling of Hazardous Waste Materials must be handled with extreme care to ensure compliance with federal, state, local regulations and to protect the health of our employees and the environment. This document will serve as an overview for the handling of hazardous waste at our facility.

Sources of Hazardous Waste:

Hazardous waste is defined in 40 CFR 261 over several paragraphs, but include:

- A mixture of solid waste and one or more hazardous wastes...
- A discarded hazardous waste, commercial chemical product, or chemical intermediate...
- Wastewater resulting from laboratory operations containing toxic wastes...

Any co-mingled liquid that is deemed unsalable and un-recoverable will be specified as waste. Any liquid that contains a list of chemicals that make it ignitable, corrosive, reactive, toxic or otherwise harmful to the environment will be identified as a "hazardous waste." This does not include domestic sewage, household waste or a sample collected for testing. For a complete definition and listing of chemicals, see 40 CFR 261.

Apollo's production activities generate hazardous waste streams as a byproduct and are listed below:

- Hazardous waste liquids: Mix Tanks, transfer lines, filler washouts, product performance testing, spills and bath filtration residue and containment areas.

- Hazardous waste solids: Spill cleanup, filters, rags, and absorbent pads, mop heads, PPE items and Light Tubes / Bulbs.

Hazardous Waste Determinations:

The determination on when a recovered product or material can no longer be reused as such and must be discarded (potentially as a hazardous waste) will be made by the Environmental Manager, the Quality Control Manager, or the Production Manager. In most cases, recovered product or material from each production batch will still hold value and be considered a product and not waste. Examples of situations where recovered product would need to be discarded as a waste would be where the material was significantly contaminated with other materials incompatible with the subsequent production run or where the quality of the material no longer conformed to Apollo standards. Determinations are made typically at the end of each production batch run in between startup of new production runs

Employee Handling of Waste:

Anyone handling hazardous waste must use the appropriate PPE equipment for the job. If the person is unsure about what protection to use they must ask their Supervisor and / or Safety Manager.

All employees that handle hazardous waste must complete "Right to Know" and "Hazardous Waste Training" by certified trainer annually.

- Do not combine hazardous waste with non-hazardous wastes.
- All hazardous waste containers shall remain closed except when adding or removing waste.
- Containers of liquid waste or liquid hazardous waste shall be stored on secondary containment capable of holding the entire contents of the container.
- Never store more than 55-gallons of hazardous waste at a designated satellite accumulation area.

Hazardous Waste Liquids:

Upon determination that a recovered material or product is a waste, the hazardous waste liquids will be transferred from the satellite accumulation containers (typically 5-gallon buckets) to designated hazardous waste drums.

Hazardous waste liquids will be collected in specifically identified 55-gallon metal drums that must remain sealed unless in use. Inspections of these hazardous waste storage drums and storage areas will be performed and recorded using Form 400g. Hazardous waste accumulation drums will be located at or near production lines and within the batching/compounding room. Only drums that have been approved by the Environmental Manager will be used for the storage of liquid hazardous waste.

SMYRNA OPERATIONS

Once a 55-gallon drum is full the drum will be taken to the compounding area and the contents transferred into the hazardous waste storage tank ST 45.

The contents of the hazardous waste drum will be transferred via a hard pipe transfer line to the external Hazardous waste tank ST 45. This transfer will be completed on a regular basis. The hazardous waste system of storage and transfer will be monitored – tracked daily on Form 400da – to ensure the integrity of the system. The Environmental Manager will inspect the hazardous waste liquid collection system each business day and note problems in the daily Inspection form (Form 400a). This Manager will arrange for maintenance requirements on any part of the waste system. A Deputy Environmental Manager has been appointed.

Laboratory Personnel will collect the liquid waste generated during product performance testing in the properly labeled 5-gallon satellite accumulation area container, located in the laboratory. They will empty this container as needed directly into a designated liquid hazardous waste accumulation drum.

The Environmental Manager will arrange for proper offsite disposal of hazardous waste liquid,. This is completed as necessary.

The Environmental Manager will arrange for the proper offsite disposal of the hazardous waste ensuring that the contents do not remain onsite past a 90-day storage limit. All shipments of hazardous waste will be documented and tracked and copies of all hazardous wastes shipment manifest will be retained in the environmental files.. All shipments are recorded using the Uniform Hazardous Waste Manifest (Form 400c).

Hazardous Waste Solids:

This waste stream is generated plant-wide, and consists primarily of spill cleanup materials, mop heads (when cleaning up hazardous waste or solvent spills) plus rags and absorbent pads plus spent filter media. A properly labeled open-top 55 gallon drum is maintained in a designated area in the chemical inventory racks. When this full drum is sent for offsite disposal a replacement drum with appropriate labeling is put into the designated location.

All employees are responsible for placing hazardous waste solids, generated in their work area, into the proper collection container located in the compounding area. The labeled container must be kept covered at all times, unless it is being emptied or filled. See Diagram 400b. 5 gallon containers with closures are located strategically in various areas of the production area and are used for Satellite Accumulation Areas.

The Environmental Manager will oversee the transfer of the hazardous waste solids collection container into the appropriate drum which is located in the chemical rack area. The hazardous waste solid drums will be inspected daily, with notations being made in the Daily Inspection Log and the HAZWASTE Drums Storage and Disposal Log (Forms 400f & 400e respectively). The Environmental Manager will arrange for the proper offsite disposal of the hazardous waste solids drums, making sure that no drum onsite past the 90-day storage limit. All shipments are recorded using the Uniform Hazardous Waste Manifest (Form 400c).

Additional reference: Form 400-a Hazardous Waste Tank System Inspection Log
Diagram 400a Transfer & Storage Diagram
Diagram 400b Solid & Universal Waste Storage Location Diagram
Form 400-c Hazardous Waste Manifest
Form 400-e Weekly Solid Waste Log
Form 400-f Daily Solid Waste Inspection Log
Form 400-g Hazardous Waste Weekly Inspection Log

STANDARD OPERATING PROCEDURE

Apollo Technologies
Smyrna, GA

PRP-406-00

Response to Spills

Scope: The scope of this procedure is to define when and how Apollo employees will respond to anticipated spills that may occur at the operations.

Sources of Spills: The typical sources of spills of both hazardous and non-hazardous materials and wastes include the following activities. Apollo will manage the removal of spilled material in a manner that will allow them to potentially use the spilled material/product within future products as a waste minimization effort.

- Accumulation in product filling line drip pans
- Accumulation in drum/container secondary containment
- Accumulation in tank secondary containment
- Accumulation in tanker truck unloading/loading containment bay
- Release of liquid hazardous wastes to floor
- Release of oil and oil based liquids during drum transfer

Employee Response to Spills:

A **Spill** can be either a liquid or solid and represents materials, products, or wastes that escape from their designated container but are still within control of and contained within the facility.

A **Release** is a spill that is no longer in control of the facility and has entered into a public water waterway, municipal waste water system, or has penetrated into exposed surface soils.

Apollo employees will not respond to spills or releases of more than 220 gallons of hazardous materials. In the event that there is a large spill, the employee will call the designated Apollo emergency response coordinator whom will take control of the situation and alert both additional internal and external parties. Apollo will respond to Spills in a manner to potentially prevent or avoid a Release.

For very small, minor leaks or spills, or spills of nonhazardous substances, Apollo Technologies is equipped with the following tools, engineering controls, emergency cleanup materials and personal protective equipment:

- Spill Pillows for soaking up minor sills of solvents, oils, acids and bases.
- Pails of loose absorbent material for soaking up spills of solvents, oils, acids and bases;

- Pails of granular sodium carbonate for absorbing and neutralizing spilled acids.
- Non-sparking shovels and scoops for dispensing absorbent materials and sodium carbonate.
- Empty pails and drums for containing absorbent material used to soak up spills.
- Vinyl, latex and neoprene gloves.
- Eye wash station.
- Exhaust ventilation
- First aid kit
- Chemical splash goggles.
- Fire Extinguishers

If the spill is determined by someone trained in hazardous waste management to be minor (such as a small leak or small spill) and not a threat to the life, health or well-being of any individual, and does not produce any toxic or irritating vapors, then the following cleanup procedure may be carried out: If there is any doubt as to the severity of the incident, then notify the Chemical Safety Coordinator or the Plant Manager.

- The contaminated area is roped off or otherwise protected from unauthorized entry.
- Absorbent is spread around the leaking container in sufficient quantity to absorb and contain the leaking material.
- The spent absorbent medium is placed with scoops into a DOT-approved open head steel or plastic drum, whichever is appropriate for containing the spilled material. The drum must have a HAZARDOUS WASTE label on its side with Apollo's name, street address, Apollo's EPA identification number, date the barrel was filled, and a complete chemical description of the waste inside. The barrel must be stored at the Hazardous Waste Storage Area prior to off-site disposal by a licensed hazardous waste handler.
- Contaminated surfaces are cleaned with a non-toxic solvent or water-soluble cleaner and the contaminated cleaning supplies placed in the barrel with the bulk of the absorbed spill.

Hazardous Waste Determinations:

In most cases, a material or product that is recovered and subsequently determined to be a waste to be discarded will be managed as a hazardous waste. Apollo utilizes many types of chemicals with the majority being classified as ignitable (flash point less than 140°F) and thus would be classified as D001. In some cases, the discarded material would also be characteristic for other waste codes based on the presence of specific solvents (such as D035 for MEK). The actual determination of appropriate hazardous waste codes is made by the Environmental Manager.

Disposal of Spilled/Cleanup Materials:

After a spilled material, product, or waste is properly captured and contained and is determined to be a waste, a determination will be made on how the waste will be disposed. The Environmental Manager will work with an emergency response contractor or a waste disposal firm to assure that the waste is properly profiled and managed in a timely manner. Apollo will assure that all hazardous and solid wastes are shipped offsite using designated waste manifests and that the wastes are removed from the facility within all required time frames.

Apollo's primary emergency response contractor is:

Peachtree Environmental, Inc.
5384 Chaversham Lane
Norcross, Georgia 30092
770-330-3327

Apollo's secondary emergency response contractor is:

Environmental Alternatives
50 Eagle Point Court
Augusta, Georgia 3090
706-737-8433

Documentation of Spills:

All spills and/or releases will be documented using Spill Report Form PRP-406a. These completed reports will be provided to the facility General Manager and to the Vice President EHS.

STANDARD OPERATING PROCEDURE

Apollo Technologies
Smyrna, GA

FORM PRP- 406A-00
SPILL REPORT

REPORT DATE:		NAME of REPORT WRITER:			
SPILL DATE:		TIME OF SPILL:		MATERIAL SPILLED:	

TYPE OF SPILL: (check one) Instantaneous ☐ Intermittent ☐ Continuous ☐

AMOUNT RELEASED:		If continuous or intermittent, DURATION: (specify from when to when, date and times)	

EVENT DESCRIPTION: *list events that led to the spill*

ACTIONS TAKEN: *List the actions taken to stop and clean up the spill – Include who was notified and who responded.*

CORRECTIVE ACTION: *What was or will be done to prevent recurrence?*

ACTION ITEM	Responsible Person	DUE DATE	COMPLETED DATE

Written/Revised By ______________________ Date ______________
Approved By ______________________ Date ______________
Reviewed By ______________________ Date ______________
Reason for Revision

STANDARD OPERATING PROCEDURE

Apollo Technologies
Smyrna, GA

PRP-407-00

Product and Material Recovery

Scope: The scope of this procedure is to define how products and materials are recovered for reuse in the subsequent production batches and/or future production runs.

Determination of Reuse:

The determination on when a recovered product or material can no longer be reused and must be discarded (potentially as a hazardous waste) will be made by the Environmental Manager, the Quality Control Manager, or the Production Manager. In most cases, recovered product or material from each production batch will still hold value and be considered a product and not waste. Examples of situations where recovered product would need to be discarded as a waste would be where the material was significantly contaminated with other materials incompatible with the subsequent production run or where the quality of the material no longer conforms to Apollo standards. Determinations are made typically at the end of each production batch run in between startup of new production runs.

Hazardous Waste Determinations:

In most cases, a material or product that is recovered and subsequently determined to be a waste to be discarded will be managed as a hazardous waste. Apollo utilizes many types of chemicals with the majority being classified as ignitable (flash point less than 140F) and thus would be classified as D001. In some cases, the discarded material would also be characteristic for other waste codes based on the presence of specific solvents (such as D035 for MEK). The actual determination of appropriate hazardous waste codes is made by the Environmental Manager.

Employee Actions:

Product Recovery Buckets: Employees whom operate or work at the product fill lines are expected to monitor designated 5-gallon buckets used at the fill lines to assure they do not overfill. Buckets are always assured to be located in drip containment pans. The buckets are required to be emptied by placing the recovered product back into the product/batch tanks used to supply the fill line. If material spills are not captured by the product accumulation buckets, but are captured within the floor drip pans, then the production or line manger is then responsible for determining if this material/product can be reused in the production batch process.

Any rags used to collect material from the drip pans or line cleanup would need to be disposed of as a hazardous solid waste upon determination that the rags are no longer useable or at the end of each production run.

Written/Revised By ____________________ Date ____________________
Approved By ____________________ Date ____________________
Reviewed By ____________________ Date ____________________
Reason for Revision ____________________

Hazardous Waste Accumulation Buckets: At the end of each batch run when a new product is being setup, and it is known that the solvent flush will not be able to be reused, the facility will replace the product recovery buckets with the designated hazardous waste accumulation buckets. These buckets are to be used to recover the solvent that is used to flush and clean the lines between production runs when this solvent cannot be used as an ingredient in the new production run. The designated hazardous waste accumulation buckets are only allowed to be used when it is known that the solvent cannot be reused as an ingredient and must be disposed as a hazardous waste. The buckets are only to be used for temporary accumulation during the line/equipment flushing and must be immediately emptied into the designated 55-gallon hazardous waste accumulation drums.

Drip Pans: Employees whom operate or work at the product fill lines are expected to monitor drip pans used at the fill lines to assure they do not overfill. The drip pans are required to be emptied by placing the recovered product back into the product/batch tanks used to supply the fill line. If the material within the drip pan can no longer be used as product due to quality control reasons, the material will be designated as a hazardous waste and placed into the designated hazardous waste drum.

Any rags used to collect material from the drip pans would need to be disposed of as a hazardous solid waste upon determination that the rags are no longer useable or at the end of each production run.

Batching Room Accumulation Sumps: Employees whom operate or work at the batch or compounding rooms are expected to monitor designated all collection sumps to assure they do not overfill. The sumps are required to be emptied by placing the recovered product back into the product/batch tanks used to supply the fill line. If the material within the sumps can no longer be used as product due to quality control reasons, the material will be designated as a hazardous waste and placed into the designated hazardous waste drum.

Any rags used to collect material from the drip pans would need to be disposed of as a hazardous solid waste upon determination that the rags are no longer useable or at the end of each production run.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

SEP 27 2012

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Barbara H. Gallo
Krevolin & Horst LLC
One Atlantic Center
1201 West Peachtree Street, N.E.
Suite 3250
Atlanta, Georgia 30309

Re: Apollo Industries, Inc.
Consent Agreement and Final Order, Docket Number: RCRA-04-2012-4014(b)

Dear Ms. Gallo:

Enclosed is a copy of the fully executed Consent Agreement and Final Order (CA/FO) as filed with the Regional Hearing Clerk (RHC) in the above referenced matter. The CA/FO was effective upon filing with the RHC and payment of the civil penalty is to be paid in accordance with the following schedule, calculated from the effective date:

- $20,074.97 within thirty (30) calendar days of the effective date of this CA/FO
- $20,074.97 within 120 calendar days of the effective date of the CA/FO
- $20,074.97 within 210 calendar days of the effective date of the CA/FO
- $20,074.97 within 300 calendar days of the effective date of the CA/FO

As a reminder, copies of all payments should be submitted to both of the following individuals:

Patricia Bullock
Regional Hearing Clerk
U.S. EPA, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960

And to:

Larry L. Lamberth, Chief
South Section, RCRA & OPA Enforcement and Compliance Branch
RCRA Division
U.S. EPA - Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

769151

Docket No.

In addition to the payment of a civil penalty, within thirty (30) calendar days of the effective date of the CA/FO, a duly authorized representative of Apollo Industries, Inc. must submit a signed certification statement to the EPA stating that the Smyrna facility is in compliance with the Georgia hazardous waste program and RCRA and that all violations alleged in this CA/FO have been corrected.

Also enclosed is a copy of a document titled "Notice of Securities and Exchange Commission Registrants' Duty to Disclose Environmental Legal Proceedings." This document puts Apollo Industries, Inc. on notice of its potential duty to disclose to the Securities and Exchange Commission any environmental actions taken by the EPA.

If you have any questions, please feel free to contact me at (404) 562-9441 or dixit.naeha@epa.gov.

Sincerely,

Naeha Dixit

Naeha Dixit
Assistant Regional Counsel

Enclosures

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4

IN THE MATTER OF:	)	Docket Number: RCRA-04-2012-4014(b)
	)	
Apollo Industries, Inc. 1850 S. Cobb Industrial Blvd. Smyrna, Georgia 30082	)	Proceeding under Section 3008(a) of the Resource Conservation and Recovery Act, 42 U.S.C. § 6928(a)
EPA ID No.: GAD 051 021 285	)	
Respondent	)	

RECEIVED
EPA REGION IV
2012 SEP 27 AM 9:42
HEARING CLERK

CONSENT AGREEMENT

I. NATURE OF THE ACTION

1. This is a civil administrative enforcement action, ordering compliance with the requirements of Sections 12-8-60 through 12-8-83 of the Georgia Hazardous Waste Management Act (GHWMA), Ga. Code Ann. § 12-8-60 et seq. [Subtitle C of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6921-6939e]. This action seeks civil penalties pursuant to Section 3008(a) of RCRA, 42 U.S.C. § 6928(a), for alleged violations of Ga. Code Ann. § 12-8-66 [Section 3005(a) and (e) of RCRA, 42 U.S.C. § 6925(a) and (e)] and the regulations promulgated pursuant thereto, set forth in the Georgia Hazardous Waste Management Rules, codified at Ga. Comp. R. and Regs. 391-3-11.01 through 391-3-11.18 [Title 40 of the Code of Federal Regulations (40 C.F.R.) Parts 260 through 270 and 273].

2. The *Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation/Termination or Suspension of Permits*, 40 C.F.R. Part 22, provide that where the parties agree to settlement of one or more causes of action before the filing of a complaint, a proceeding may be simultaneously commenced and concluded by the issuance of a Consent Agreement and Final Order (CA/FO). 40 C.F.R. §§ 22.13(b) and 22.18(b)(2).

3. The parties have conferred solely for the purpose of settlement pursuant to 40 C.F.R. § 22.18 and desire to settle this action. Accordingly, before any testimony has been taken upon the pleadings and without any admission of violation or adjudication of any issue of fact or law and in accordance with 40 C.F.R. § 22.13(b), the parties have agreed to the execution of this CA/FO, and Respondent hereby agrees to comply with the terms of this CA/FO.

II. THE PARTIES

4. Complainant is the Chief, RCRA and OPA Enforcement and Compliance Branch, RCRA Division, Region 4, United States Environmental Protection Agency (the EPA).

5. Respondent is Apollo Industries, Inc., a corporation incorporated under the laws of the State of Georgia (Georgia or the State) and doing business in the State. Respondent is located at 1850 S. Cobb Industrial Boulevard, in Smyrna, Georgia

III. PRELIMINARY STATEMENTS

6. Pursuant to Section 3006(b) of RCRA, 42 U.S.C. § 6926(b), Georgia has received final authorization from the EPA to carry out certain portions of a hazardous waste program in lieu of the federal program set forth in RCRA. The requirements of the Georgia authorized program are found at Ga. Code Ann. § 12-8-60 through 12-8-83 and Ga. Comp. R. and Regs. 391-3-11.01 through 391-3-11.18.

7. Pursuant to Section 3006(g) of RCRA, 42 U.S.C. § 6926(g), the requirements established by the Hazardous and Solid Waste Amendments of 1984 (HSWA), Pub. L. 98-616, are immediately effective in all states regardless of their authorization status and are implemented by the EPA until a state is granted final authorization with respect to those requirements. Georgia has received final authorization for certain portions of HSWA, including those recited herein.

8. Although the EPA has granted the State authority to enforce its own hazardous waste program, the EPA retains jurisdiction and authority to initiate an independent enforcement action pursuant to Section 3008(a)(2) of RCRA, 42 U.S.C. § 6928(a)(2), to address violations of the requirements of the authorized state program. The EPA exercises this authority in the manner set forth in the Memorandum of Agreement between the EPA and Georgia.

9. As Georgia's authorized hazardous waste program operates in lieu of the federal RCRA program, the citations for the violations alleged herein will be to the authorized Georgia program; however, for ease of reference, the federal citations will follow in brackets.

10. Pursuant to Section 3008(a)(2) of RCRA, 42 U.S.C. § 6928(a)(2), Complainant has given notice of this action to the State before issuance of this CA/FO.

11. Ga. Code Ann. § 12-8-64(1)(A) [Section 3002(a) of RCRA, 42 U.S.C. § 6922(a)], requires the promulgation of standards applicable to generators of hazardous waste. The implementing regulations for these requirements are found at Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. Part 262].

12. Ga. Code Ann. § 12-8-64(1)(A) [Section 3004 of RCRA, 42 U.S.C. § 6924] requires the promulgation of regulations establishing standards applicable to owners and operators of hazardous waste treatment, storage and disposal facilities. The implementing regulations for these requirements are found at Ga. Comp. R. and Regs. 391-3-11-.10(2) [40 C.F.R. Part 264].

13. Ga. Code Ann. § 12-8-66 [Section 3005(a) and (e) of RCRA, 42 U.S.C. § 6925(a) and (e)] sets forth the requirement that a facility treating, storing, or disposing of hazardous waste must either have a permit or achieve interim status, unless it is otherwise exempt as provided by the applicable regulations. The implementing regulations for this requirement are found at Ga. Comp. R. and Regs. 391.3-11-.10(1) (interim status) and (2) (permitted) [40 C.F.R. Parts 264 (permitted) and 265 (interim status)].

14. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. § 261.2], the term "solid waste" means any discarded material that is not otherwise excluded by regulation. A discarded material includes any material that is abandoned by being stored in lieu of being disposed.

15. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. § 261.3], a solid waste is a "hazardous waste" if the solid waste meets any of the criteria set out in Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. § 261.3(a)(2)] and it is not otherwise excluded from regulation as a hazardous waste by operation of Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. § 261.4(b)].

16. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10], the term "person" means an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, municipality, commission, or political subdivision, or any agency, board, department, or bureau of this state or of any other state or of the federal government.

17. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10], the term "generator" means any person, by site, whose act or process produces hazardous waste identified or listed in Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. Part 261] or whose act first causes a hazardous waste to be subject to regulation.

18. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10], the term "facility" means all contiguous land and structures, other appurtenances and improvements on the land, used for treating, storing, or disposing of hazardous waste.

19. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10], the term "owner" means the person who owns a facility or part of a facility and the term "operator" means the person responsible for the overall operation of a facility.

20. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10], the term "tank" means a stationary device, designed to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials (*e.g.*, wood, concrete, steel, plastic) which provide structural support.

21. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10], the term "tank system" means a hazardous waste storage or treatment tank and its associated ancillary equipment and containment system.

22. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 264.1031], the term "equipment" means each valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange or other connector, and any control devices or systems.

23. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. §§ 261.3(a)(2)(i) and 261.21], a solid waste that exhibits the characteristic of ignitability is a hazardous waste and is identified with the EPA Hazardous Waste Number D001.

24. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. §§ 261.3(a)(2)(i) and 261.22], a solid waste that exhibits the characteristic of corrosivity is a hazardous waste and is identified with the EPA Hazardous Waste Number D002.

25. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. §§ 261.3(a)(2)(i) and 261.24], solid wastes that exhibit the characteristic of toxicity for methyl ethyl ketone, tetrachloroethylene, and trichloroethylene are hazardous wastes and are identified with the EPA Hazardous Waste Numbers D035, D039, and D040, respectively.

26. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.07(1) [40 C.F.R. §§ 261.3(a)(2)(ii) and 261.31], a solid waste is a hazardous waste from a nonspecific source if is listed in 40 C.F.R. § 261.31 and has not been excluded under 40 C.F.R. §§ 260.20 and 260.22 and is listed in Appendix IX. Hazardous wastes from nonspecific sources are identified with the EPA Hazardous Wastes Numbers F001 through F039.

27. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)], a generator of greater than 1,000 kilograms of hazardous waste in a calendar month may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status, as required by Ga. Code Ann. § 12-8-66 [Section 3005(a) and (e) of RCRA, 42 U.S.C. § 6925(a) and (e)], provided that the generator complies with the management requirements listed in Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)(1)-(4)] (hereinafter referred to as the "LQG Permit Exemption").

28. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)(1)(ii)], which incorporates the requirements of Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. §§ 265.1050(c) and .1064], conditions of the LQG Permit Exemption require equipment that contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight for more than 300 hours per calendar year to be marked in such a manner that they can be distinguished readily from other pieces of equipment, and to have information about each such piece of equipment recorded in the facility operating record.

29. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)(1)(ii)], which incorporates the requirements of Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.1083], a condition of the LQG Permit Exemption requires a tank system for which hazardous waste entering the unit has an average volatile organic concentration greater than 500 parts per million by weight to be subject to the requirements specified in Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.1085], including determining the maximum organic vapor pressure, and conducting appropriate inspections.

30. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)(1)(ii)], which incorporates the requirements of Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.195], conditions of the LQG Permit Exemption require a facility to inspect all above ground portions of a tank system and the area immediately surrounding the tank system, including the secondary containment system, and to document in the operating record of the facility these inspections.

31. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)(1)(ii)], which incorporates the requirements of Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.193(f)], a condition of the LQG Permit Exemption requires a facility to provide full secondary containment for a tank system's ancillary equipment including portions of hazardous waste pipeline that have threaded flanges, valves, fittings, and connectors.

32. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)(4)], which incorporates the requirements of Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.16(d)], a condition of the LQG Permit Exemption requires a facility to maintain training records, including job titles and descriptions, in the facility records.

33. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(a)(4)], which incorporates the requirements of Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.16(c)], a condition of the LQG Permit Exemption requires a facility to provide annual refresher training to facility personnel.

34. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.08(1) [40 C.F.R. § 262.34(c)(1)(ii)], a generator may accumulate up to fifty-five (55) gallons of hazardous waste at or near the point of generation without a permit or without having interim status provided, among other things, the generator marks the hazardous waste accumulation containers either with the words "Hazardous Waste" or with other words that identify the contents of the containers.

35. Pursuant to Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.173(a)], a generator may accumulate up to fifty-five (55) gallons of hazardous waste at or near the point of generation without a permit or without having interim status provided, among other things, the generator keeps hazardous waste accumulation containers closed at all times, except when adding or removing waste.

IV. EPA'S ALLEGATIONS AND DETERMINATIONS

36. Respondent is a "person" within the meaning of Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10].

37. At all times relevant to this CA/FO, Respondent is the "owner" and/or "operator" of a "facility" located at 1850 S. Cobb Industrial Boulevard, in Smyrna, Georgia as those terms are defined in Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10].

38. At the facility, Respondent manufactures and packages for distribution several organic and water based solvent cleaners, pesticides, and janitorial aerosol products.

39. In its February 7, 2008 Notification of Regulated Waste Activity (EPA Form 8700-12), Respondent indicated that the facility is a Large Quantity Generator of hazardous wastes, including D001, D002, D035, D039, and D040 characteristic hazardous wastes and F001, F002, F003, and F005 listed hazardous wastes.

40. On December 13, 2010, the EPA and the Georgia Environmental Protection Division (GAEPD) conducted a RCRA Compliance Evaluation Inspection (CEI) at the facility to determine the facility's compliance status with RCRA (December 2010 CEI).

41. On July 26, 2011, the EPA conducted a follow-up CEI at the facility (July 2011 CEI).

42. Respondent operates a "tank" that contained "hazardous waste" and is a part of a "tank system" as those terms are defined in Ga. Comp. R. and Regs. 391-3-11-.02(1) [40 C.F.R. § 260.10].

43. Respondent operates "equipment" as that term is defined in Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 264.1031].

44. At the time of both the December 2010 CEI and the July 2011 CEI, Respondent had not properly determined the total organic content of its hazardous waste contained in the hazardous waste storage tank outside the facility's production building.

45. In August 2012, Respondent determined that the total organic concentration in its hazardous waste stream is greater than 10%.

46. At the time of both the December 2010 CEI and the July 2011 CEI, Respondent had not marked each piece of equipment in such a manner that they can be distinguished readily from other pieces of equipment, nor kept sufficiently detailed records about each piece of equipment.

47. The EPA therefore alleges that Respondent violated Ga. Comp. R. & Regs. 391-3-11-.10(1) [40 C.F.R. §§ 265.1050(c) and .1064].

48. At the time of both the December 2010 CEI and the July 2011 CEI, Respondent had not determined the maximum organic vapor pressure of the hazardous waste contained in the hazardous waste storage tank outside the facility's production building, nor had Respondent conducted appropriate inspections.

49. The EPA therefore alleges that Respondent violated Ga. Comp. R. & Regs. 391-3-11-.10(1) [40 C.F.R. § 265.1085].

50. At the time of the December 2010 CEI, Respondent did not have a sufficiently detailed inspection program, including record keeping, to ensure adequate inspections and recordkeeping were occurring.

51. The EPA therefore alleges that Respondent violated Ga. Comp. R. & Regs. 391-3-11-.10(1) [40 C.F.R. § 265.195].

52. At the time of the July 2011 CEI, Respondent failed to provide secondary containment for some sections of its hazardous waste pipeline that have threaded flanges, valves, fittings, and connectors.

53. The EPA therefore alleges that Respondent violated Ga. Comp. R. & Regs. 391-3-11-.10(1) [40 C.F.R. § 265.193(f)].

54. At the time of the December 2010 CEI, Respondent did not have the appropriate training and job description records.

55. The EPA therefore alleges that Respondent violated Ga. Comp. R. & Regs. 391-3-11-.10(1) [40 C.F.R. § 265.16(d)].

56. At the time of the July 2011 CEI, Respondent failed to provide annual RCRA refresher training to one employee.

57. The EPA therefore alleges that Respondent violated Ga. Comp. R. & Regs. 391-3-11-.10(1) [40 C.F.R. § 265.16(c)].

58. At the time of the July 2011 CEI, Respondent was using a thirty (30) gallon container to collect all hazardous wastes generated at the facility for pumping to the hazardous waste storage tank. The EPA inspector observed that the container had an open bunghole at time when no waste was being added to or removed from the container.

59. The EPA therefore alleges that Respondent violated Ga. Comp. R. and Regs. 391-3-11-.10(1) [40 C.F.R. § 265.173(a)].

60. As a result of Respondent's violations identified in Paragraphs 47, 49, 51, 53, 55, 57, and 59, above, Respondent failed to meet the conditions of the LQG Permit Exemption. The EPA alleges that Respondent stored hazardous waste without a permit or interim status, and unless these violations are corrected, must obtain a permit, pursuant to Ga. Code Ann. § 12-8-66 [Section 3005(a) and (e) of RCRA, 42 U.S.C. § 6925(a) and (e)].

V. TERMS OF AGREEMENT

Based on the foregoing Preliminary Statements, Allegations and Determinations, the parties agree to the following:

61. For the purposes of this CA/FO, Respondent admits the jurisdictional allegations set out in the paragraphs above pursuant to Section 3008 of RCRA, 42 U.S.C. § 6928.

62. Respondent neither admits nor denies the factual allegations and determinations set out in this CA/FO.

63. Within thirty (30) calendar days of receipt of the executed copy of this CA/FO, Respondent shall submit to the EPA a certification signed by a duly authorized representative stating that the Facility is in compliance with the Georgia hazardous waste program and RCRA and that all violations alleged in this CA/FO have been corrected.
This certification shall be as follows:

"I certify under penalty of law, to the best of my knowledge and belief that all violations alleged in this CA/FO have been corrected. All work was done under my direction or supervision according to a system designed to assure that qualified personnel implemented and completed the required tasks. This certification is based on my inquiry of the person(s) who performed the tasks, or those persons directly responsible for the person(s) who performed the tasks. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

64. The certification required to be submitted under this CA/FO shall be mailed to:

Larry L. Lamberth, Chief
South Section, RCRA & OPA Enforcement and Compliance Branch
RCRA Division
U.S. EPA - Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

65. Respondent waives any right to contest the allegations and its right to appeal the proposed Final Order accompanying the Consent Agreement.

66. Respondent waives its right to challenge the validity of this CA/FO and the settlement of the matters addressed in this CA/FO based on any issue related to the Paperwork Reduction Act.

67. Respondent waives any right it may have pursuant to 40 C.F.R. § 22.8 to be present during any discussions with, or to be served with and reply to, any memorandum or communication addressed to the EPA officials where the purpose of such discussion, memorandum or communication is to persuade such official to accept and issue this CA/FO.

68. The parties agree that the settlement of this matter is in the public interest and that this CA/FO is consistent with the applicable requirements of RCRA.

69. The parties agree that compliance with the terms of this CA/FO shall resolve the violations alleged and facts stipulated to in this CA/FO.

70. Each party will pay its own costs and attorneys' fees.

VI. PAYMENT OF CIVIL PENALTY

71. Respondent consents to the payment of a civil penalty in the amount of **EIGHTY THOUSAND DOLLARS (US $80,000.00)**. Four (4) payments will be made to complete payment of the entire civil penalty including interest. The first payment is due within thirty (30) calendar days of the effective date of this CA/FO and subsequent payments will be due in ninety (90) calendar day intervals thereafter. Including the civil penalty and interest, the total amount that will be paid upon completion of all payments will be $80,299.87. Respondent shall make payments in accordance with the following schedule:

Payment No.	Payment Due Date	Payment Due
1	within 30 calendar days of the effective date of the CA/FO	$20,074.97
2	within 120 calendar days of the effective date of the CA/FO	$20,074.97
3	within 210 calendar days of the effective date of the CA/FO	$20, 074.97
4	within 300 calendar days of the effective date of the CA/FO	$20,074.96

72. Payment shall be made by cashier's check, certified check, by electronic funds transfer (EFT), or by Automated Clearing House (ACH) (also known as REX or remittance express). If paying by check, the check shall be payable to: **Treasurer, United States of America**, and the facility name and docket number for this matter shall be referenced on the face of the check. If Respondent elects to send payment by the U.S. Postal Service, the payment shall be addressed to:

United States Environmental Protection Agency
Fines and Penalties
Cincinnati Finance Center
P.O. Box 979077
St. Louis, Missouri 63197-9000

If Respondent elects to send payment by non-U.S. Postal express mail delivery, the payment shall be sent to:

U.S. Bank
Government Lockbox 979077
U.S. EPA Fines and Penalties
1005 Convention Plaza
SL-MO-C2-GL
St. Louis, Missouri 63101
(314) 418-1028

If paying by EFT, Respondent shall transfer the payment to:

Federal Reserve Bank of New York
ABA: 021030004
Account Number: 68010727
SWIFT address: FRNYUS33
33 Liberty Street
New York, New York 10045
Field Tag 4200 of the Fedwire message should read:
"D 68010727 Environmental Protection Agency"

If paying by ACH, Respondent shall remit payment to:

PNC Bank
ABA: 051036706
Account Number: 310006
CTX Format Transaction Code 22 – checking
Environmental Protection Agency
808 17th Street, N.W.
Washington, DC 20074
Contact: Jesse White, (301) 887-6548

73. At the time of payment, Respondent shall submit a separate copy of the payment and a written statement that the payment is being made in accordance with this CA/FO, to the following persons at the following addresses:

Patricia A. Bullock
Regional Hearing Clerk
U.S. EPA - Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

And to:

Larry L. Lamberth, Chief
South Section, RCRA & OPA Enforcement and Compliance Branch
RCRA Division
U.S. EPA - Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

74. If Respondent fails to make one of the installment payments in accordance with the schedule set forth above in Paragraph 73, or if the Respondent sells the Facility, the entire unpaid balance of the penalty and all accrued interest shall become due immediately upon such failure or sale, and Respondent shall immediately pay the entire remaining principal balance of the civil penalty along with any interest that has accrued up to the time of such payment. In addition, Respondent shall be liable for and shall pay administrative handling charges and late payment penalty charges as described below in the event of any such failure or default.

75. Further, if Respondent fails to pay the installment payments in accordance with the schedule set forth above in Paragraph 73, or if Paragraph 76 is triggered, in accordance with Paragraph 76, EPA may refer the debt to a collection agency, a credit reporting agency, or to the Department of Justice for filing of a collection action in the appropriate United States District Court. In any such collection action, the validity, the amount, and appropriateness of the assessed penalty and of this CAFO shall not be subject to review.

76. Notwithstanding, Respondent's agreement to pay the assessed civil penalty in accordance with the installment schedule set forth above in Paragraph 73, Respondent may pay the entire civil penalty of $80,000.00 within thirty (30) calendar days after the date on which a copy of this CAFO is mailed or hand delivered to Respondent and, thereby, avoid the payment of interest pursuant to 40 C.F.R. 13.11(a). In addition, Respondent may, at any time after commencement of payments under the installment schedule, elect to pay the entire principal balance remaining, together with interest accrued up to the date of such full payment.

77. If Respondent fails to remit the civil penalty as agreed to herein, the EPA is required to assess interest and penalties on debts owed to the United States and a charge to cover the costs of processing and handling the delinquent claim. Interest, at the statutory judgment rate provided for in 31 U.S.C. § 3717, will therefore begin to accrue on the civil penalty if it is not paid within thirty (30) calendar days after the effective date of this Consent Agreement. Pursuant to 31 U.S.C. § 3717, Respondent must pay the following amounts on any amount overdue:

   a. Interest. Any unpaid portion of a civil penalty must bear interest at the rate established by the Secretary of the Treasury pursuant to 31 U.S.C. § 3717(a)(1). Interest will therefore begin to accrue on a civil penalty or stipulated penalty if it is not paid by the last date required.

Interest will be assessed at the rate of the United States Treasury tax and loan rate in accordance with 4 C.F.R. § 102.13(c).

b. Monthly Handling Charge. Respondent must pay a late payment handling charge of fifteen dollars ($15.00) on any late payment, with an additional charge of fifteen dollars ($15.00) for each subsequent thirty (30) calendar day period over which an unpaid balance remains.

c. Non-Payment Penalty. On any portion of a civil penalty more than ninety (90) calendar days past due, Respondent must pay a non-payment penalty of six percent (6%) per annum, which will accrue from the date the penalty payment became due and is not paid. This non-payment penalty is in addition to charges which accrue or may accrue under subparagraphs (a) and (b) of this Paragraph.

78. Penalties paid pursuant to this CA/FO are not deductible for federal tax purposes under 26 U.S.C. § 162(f).

VII. PARTIES BOUND

79. This CA/FO shall be binding upon Respondent and its successors and assigns. Respondent shall cause its officers, directors, employees, agents and all persons, including independent contractors, contractors and consultants acting under or for Respondent, to comply with the provisions hereof in connection with any activity subject to this CA/FO.

80. No change in ownership, partnership, corporate or legal status relating to the facility will in any way alter Respondent's obligations and responsibilities under this CA/FO.

81. The undersigned representative of Respondent hereby certifies that she or he is fully authorized to enter into this CA/FO and to execute and legally bind Respondent to it.

VIII. RESERVATION OF RIGHTS

82. Notwithstanding any other provision of this CA/FO, an enforcement action may be brought pursuant to Section 7003 of RCRA, 42 U.S.C. § 6973, or other statutory authority, should the EPA find that the handling, storage, treatment, transportation, or disposal of solid waste or hazardous waste at Respondent's facility may present an imminent and substantial endangerment to human health or the environment.

83. Complainant reserves the right to take enforcement action against Respondent for any future violations of RCRA and the implementing regulations and to enforce the terms and conditions of this CA/FO.

84. Except as expressly provided herein, nothing in this CA/FO shall constitute or be construed as a release from any civil or criminal claim, cause of action or demand in law or equity for any liability Respondent may have arising out of, or relating in any way to, the transportation, storage, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken from Respondent's facility.

85. This CA/FO may be amended or modified only by written agreement executed by both the EPA and Respondent.

IX. OTHER APPLICABLE LAWS

86. All actions required to be taken pursuant to this CA/FO shall be undertaken in accordance with the requirements of all applicable local, state, and Federal laws and regulations. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under such laws and regulations.

X. SERVICE OF DOCUMENTS

87. A copy of any documents that Respondent files in this action shall be sent to the following attorney who represents the EPA in this matter and who is authorized to receive service for the EPA in the proceeding:

Naeha Dixit
Associate Regional Counsel
Office of RCRA, OPA and UST Legal Support
U.S. EPA – Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960
(404) 562-9441

88. A copy of any documents that Complainant files in this action shall be sent to the following individual who represents the Respondent in this matter and who is authorized to receive service for the Respondent in this proceeding:

Maria Theo-Callas
Apollo Industries, Inc.
1850 S. Cobb Industrial Blvd.
Smyrna, Georgia 30082

With a copy to Respondent's Counsel:
Barbara H. Gallo
Krevolin & Horst, LLC
One Atlantic Center
1201 W. Peachtree Street, NE
Suite 3250
Atlanta, Georgia 30309
404-888-0169

XI. SEVERABILITY

89. It is the intent of the parties that the provisions of this CA/FO are severable. If any provision or authority of this CA/FO or the application of this CA/FO to any party or circumstances is held by any judicial or administrative authority to be invalid or unenforceable, the application of such

provisions to other parties or circumstances and the remainder of the CA/FO shall remain in force and shall not be affected thereby.

XII. EFFECTIVE DATE

90. The effective date of this CA/FO shall be the date on which the CA/FO is filed with the Regional Hearing Clerk.

In the matter of Apollo Industries, Inc., Docket No. RCRA -04-2012-4014(b)

AGREED AND CONSENTED TO:

FOR
Apollo Industries, Inc.

By: Maria Callas Dated: 9/26/12
Maria Theo-Callas
CEO, Apollo Industries, Inc.

U.S. Environmental Protection Agency

By: César A. Zapata Dated: 9/26/12
César A. Zapata, Chief
RCRA and OPA Enforcement and Compliance Branch
RCRA Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4

IN THE MATTER OF: Apollo Industries, Inc. 1850 S. Cobb Industrial Blvd. Smyrna, Georgia 30082 EPA ID No.: GAD 051 021 285 Respondent	)	Docket Number: RCRA-04-2012-4014(b) Proceeding under Section 3008(a) of the Resource Conservation and Recovery Act, 42 U.S.C. § 6928(a)

FINAL ORDER

The foregoing Consent Agreement is hereby approved, ratified and incorporated by reference into this Final Order in accordance with the *Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation/Termination or Suspension of Permits*, 40 C.F.R. Part 22. The Respondent is hereby ORDERED to comply with all of the terms of the foregoing Consent Agreement effective immediately upon filing of this Consent Agreement and Final Order with the Regional Hearing Clerk. This Order disposes of this matter pursuant to 40 C.F.R. §§ 22.18 and 22.31.

BEING AGREED, IT IS SO ORDERED this 27 day of Sept., 2012.

BY: Susan B. Schub
Susan B. Schub
Regional Judicial Officer
EPA Region 4

CERTIFICATE OF SERVICE

I hereby certify that I have this day filed the original and a true and correct copy of the foregoing Consent Agreement and the attached Final Order (CA/FO), in the Matter of Apollo Industries, Inc., Docket Number: RCRA-04-2012-4014(b), and have served copies on each of the parties listed below in the manner indicated:

Naeha Dixit
Associate Regional Counsel
Office of RCRA, OPA and UST Legal Support
U.S. EPA – Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960
(404) 562-9441

(Via the EPA Electronic Mail)

Javier Garcia
RCRA and OPA Enforcement and
Compliance Branch
U.S. EPA - Region 4
61 Forsyth St., S.W.
Atlanta, Georgia 30303

(Via the EPA Electronic Mail)

Barbara H. Gallo
Krevolin & Horst LLC
One Atlantic Center
1201 West Peachtree Street, N.E.
Suite 3250
Atlanta, Georgia 30309

(Via Certified Mail - Return Receipt Requested)

Date: 9-27-12

Patricia A. Bullock
Regional Hearing Clerk
U.S. EPA - Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303
(404) 562-9686

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apollo technologies
PRODUCTS TO FILL ESSENTIAL NEEDS

October 15, 2012

Ms. Patricia A. Bullock
Regional Hearing Clerk
U.S. EPA – Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

Subject: CA/FO RCRA-04-2012-4014(b)
Compliance Certification
Apollo Technologies, Inc.

Dear Mr. Truman,

Pursuant to Paragraph 63 of CA/FO RCRA-04-2012-4014(b), the following certification is provided to acknowledge that the facility has corrected all violations alleged in this CA/FO and that the facility, to the best of its knowledge, is in compliance with all RCRA requirements.

CA/FO Paragraphs 47 (Total Organic Carbon Determination, Equipment Identification and Records)

As explained in Apollo's CEI response dated March 23, 2011, organic waste vapor pressure and TOC determinations had been completed in the past through periodic analysis and waste profiles that were prepared by waste handlers and through generator knowledge. Apollo had assumed that based on this information, the characteristics of the liquid hazardous waste were such that the waste TOC were below 10%. Subsequent to the NOV, additional waste evaluations have been made including 2 total volatile analysis and one TCLP analysis to complete a waste characterization based on analytical data rather than generator knowledge and upon data that was previously collected several years in the past. Based on this analysis, an updated waste characterization has been prepared. The results of this analysis indicate that the liquid hazardous waste should be characterized as having a TOC content exceeding 10%. All hazardous waste piping and equipment has been identified and records of the equipment are documented within a third party engineering review of the system.

CA/FO Paragraph 49 (Maximum Organic Vapor Pressure and System Inspections)

Subsequent to the NOV, additional waste evaluations have been made including 2 total volatile analyses and one TCLP analysis to complete a waste characterization based on analytical data, including determination of maximum organic vapor pressure. A third party engineering review and inspection of the hazardous waste system (July 2012) has been completed.

Docket No. 774040

CA/FO Paragraph 51 (Failure to Maintain Sufficient Hazardous Waste Tank System Inspections)

Apollo has consistently completed inspections of the hazardous waste tank system including all piping and containment areas to assess for any signs of leaks, spills, or structural issues associated with the storage tank, piping, and containment systems. The inspection forms previously utilized by Apollo did not indicate all specific areas being inspected; however, this cannot be interpreted to assume that since these items were not specifically cited on the inspection form that they were not done. Beginning in April 2011, the inspection form was modified to include more details on the required elements of the routine inspections and these inspection forms will continue to be evaluated over time to improve upon them.

CA/FO Paragraph 53 (Hazardous Waste Tank Transfer Line Secondary Containment)

The area of piping associated with the line used to pump out the liquid hazardous waste from the storage tank was observed during the CEI to be located outside of the secondary containment area. Since the time of this observation, a secondary containment pad was constructed and a chemical resistant coating has been applied. It is also noted that the results of the tank and system integrity assessment indicate that there are no systems leaks or integrity issues associated with any of the system piping.

CA/FO Paragraph 55 and 57 (Failure to maintain training records pertaining to hazardous waste)

Apollo has always maintained documentation of the specific job title and position for all employees within the company. This information was not clearly identified in the hazardous waste training program information at the time of the CEI, but has always utilized this to assure that each individual within a specific position was properly trained, including applicable hazardous waste management elements. Subsequent to the CEI and NOV, Apollo has developed additional hazardous waste management program documentation and SOPs to improve its training programs.

CA/FO Paragraph 59 (Failure to maintain a closed container)

All employees have been further trained to assure that containers used to store hazardous waste are closed when not in use. Routine inspections are performed to assure that containers of hazardous waste are closed when not in use. The container previously cited by EPA is no longer used for the operation.

CA/FO RCRA-04-2012-4014(b)
Compliance Certification
October 15, 2012

1 certify under penalty of law, to the best of my knowledge and belief that all violations alleged in this CA/FO have been corrected. All work was done under my direction or supervision according to a system designed to assure that qualified personnel implemented and completed the required tasks. This certification is based on my inquiry of the person(s) who performed the tasks, or those persons directly responsible for the person(s) who performed the tasks. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Christopher Hurst
Vice President EHS
Apollo Technologies, Inc.

copy: Maria Theo-Callas, Apollo
Barbara Gallo, Krevolin & Horst LLC
Mr. Larry L. Lamberth, USEPA